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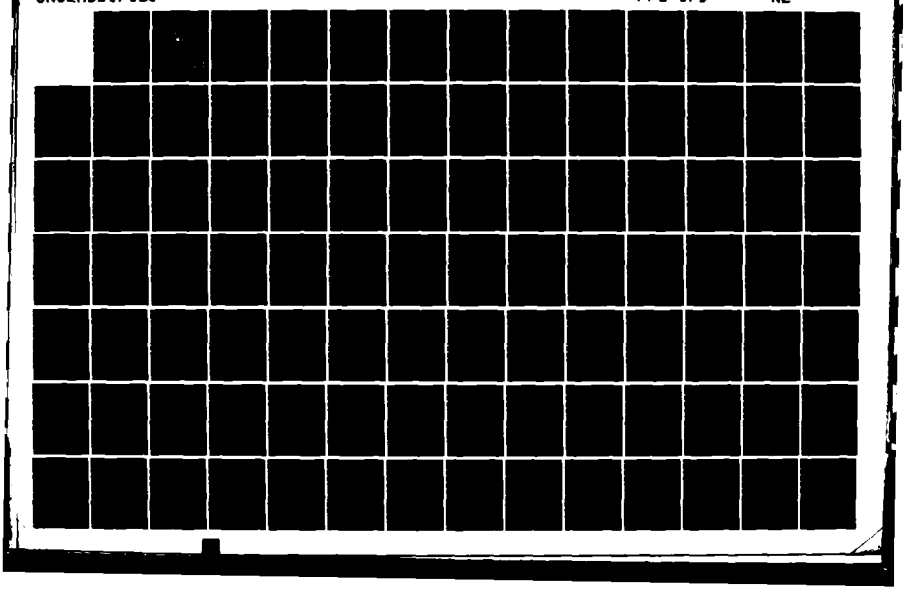

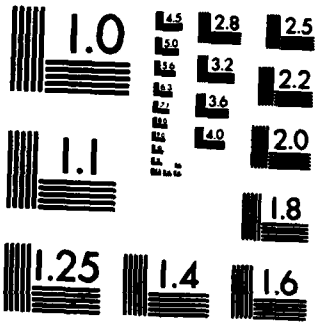

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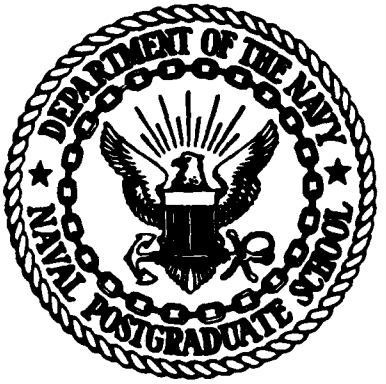

THESIS

SPECIFICATION OF VETERAN STATUS IN ESTIMATING POST-SERVICE CIVILIAN EARNINGS

by

Roger J. Higgins

June 1984

Thesis Advisor: George W. Thomas

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Specification of Veteran Status in Estimating Post-Service Civilian Earnings

by

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ABSTRACT

This thesis analyzes the earnings of veterans and non-veterans by race over a fourteen year period from 1966 to 1980, using the National Longitudinal Survey for Young Men aged 14 to 24 in 1966. The primary finding is that bona-fide first term enlistees tend to have different returns to their veteran status than veterans as a whole and multi-term veterans in particular, and that these returns, on average, tend to be positive. This thesis also develops criteria for a single term of enlistment by length of service in a particular branch of the armed forces. In support of these findings, a working definition of full employment is also developed. The estimates of earnings equations for the fully employed subset of people are compared to the entire sample of National Longitudinal Survey of Young Men.

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I. INTRODUCTION

A. PROBLEM

The issue of how veterans of military service, expecially short-term enlistees, fare in the civilian labor market subsequent to their military service is an issue of considerable importance in manpower and personnel planning within the Department of Defense and other government bodies. Depending upon how veterans do fare in the civilian labor market, there are differing and potentially far-ranging implications. If, for example, it were found that veterans suffered permanent income losses stemming from service in the armed forces, higher military pay and enhanced veterans' education packages (such as the GI Bill) would have to be considered. If on the other hand, it were found that veterans benefitted for whatever reason from military service, the implications would be much different. These concerns are especially crucial during periods of compulsory service. The Fifth Quadrenniel Review of Military Compensation's work in this area (QRMC) is a reflection of these concerns.

This thesis deals with two aspects of the problem of measuring the performance of veterans in post military service competition in the labor market with nonveterans. The first is to examine the theory of human capital and its

applications to earnings functions over a period of time. The second is to deal with the problem of defining exactly what a veteran is and how that definition might change under differing circumstances.

The data set used is the National Longitudinal Survey of 5,225 young men aged 14 to 24 in 1966 (NLS boys). There are eleven panels of the survey stretching over a fourteen year period from 1966 to 1980. The twelfth panel, conducted in 1981, became available too late for inclusion into this analysis. This data set represents a unique opportunity to examine the interrelationships of various human capital related factors in the same individuals over an extended period of time.

B. HYPOTHESES

The working hypotheses were three:

(1) That human capital factors tended to contribute to the income of an individual and that income tended to rise rapidly during the first years of participation in the labor force and to level off in later years, allowing the use of a log-linear regression equation to capture the relationships.

(2) That bonafide first term enlistees tend to have different returns to their veteran status than veterans as a whole and multi-term veterans in particular, and that these returns, on average, tended to be negative. Several recent works using this data set have supported this hypothesis, while others, using different data sets, have not.

(3) That fully employed individuals tend to follow the pattern of log-linear relationships between income and the human capital factors more closely than those not meeting that criterion.

The next chapter will present a brief overview of human capital theory as it was applied in this thesis together with a short description of the more recent works relevant to this topic. The third chapter presents a description of the data set and definitions of variables. The fourth chapter presents the estimates of a general equation for (a) a pooled cross-sectional/time-series data set including all eleven panels; (b) each of the eleven panels used. These findings are broken down by veteran status and race. The fifth chapter discusses different formats for defining veteran status. It also examines the definition of full time employment as it pertains to this particular data set. The last chapter presents conclusions and recommendations for further research.

II. HUMAN CAPITAL THEORY AND THE EFFECT OF MILITARY SERVICE ON POST SERVICE EARNINGS

A. HUMAN CAPITAL THEORY

"Long range supply decisions involve changes in all conditions affecting the quantity and quality of labor offered to the market" [Ref. 1]. Decisions such as whether or not to obtain vocational training or post-secondary education, or whether or not to relocate to a different labor market are all decisions involving current opportunity costs balanced against future returns. This is the very basis of human capital theory as it has been expressed by Becker (1975) and Mincer (1974).

Investment in human capital factors such as higher education or vocational training generally occurs prior to entry into the labor market by a particular individual as a full time participant. Thus the changes in income of a particular group can be measured as a function of changes in these human capital factors. Alternatively, entry into the labor market may be followed by withdrawal in order to go back to school. However, once an individual is in the labor market, the pattern of wage growth as a function of time in the labor market as measured by age or years of experience tends to follow a very predictable pattern of rapidly increasing in the early years before levelling off and

finally declining slightly as an individual nears retirement. Peak wage earning years usually occur in the fifth decade of life. The usual form of regression equations used in estimating the rate of return to various investments in human capital is a log-linear one, first developed by Mincer (1974):

$$\ln Y(s) = \ln Y(0) + rS \qquad \text{(eqn 2.1)}$$

where Y(s) is the income after investment; Y(0) is the income prior to, or without the investment; S is the particular investment; r is the rate of return estimated by the coefficient in a regression equation [Ref. 1: p. 295].

Numerous studies have been conducted investigating the rates of return to such variables as education (both secondary and post-secondary), vocational training and union membership. These are factors concerning which rational investment decisions can be made by the individual. There are also other factors which apparently can help predict income levels. They include marital status, geographical location of residence (empirical investigation has established that until recently, there were, ceteris paribus, systematically lower earnings for individuals living in the South as compared to other regions of the country. See Chapter 4), race, unemployment rates, ability and socioeconomic status [Ref. 2].

Estimating returns to military service (veteran status) using the theory of human capital is an ideal way to

investigate empirically whether or not military service can help or hurt an individual in terms of future earning power when compared to his peers who did not serve in the military. As mentioned in the introduction, this has some important sociological and financial implications for not only the armed forces, but society as a whole.

B. REVIEW OF PAST STUDIES

Reams systematically reviewed the major works in this field as recently as 1983, [Ref. 2] following a previous review of this literature by Chamarette [Ref. 3] in 1980. This paper focuses on three recent works. The first is Reams himself, who found negative returns to veteran status. The second is De Tray who, in a 1980 RAND paper, found that veteran status was a useful screening device that brought significant positive returns to veterans throughout the post World War II era [Ref. 5]. The third work, not reviewed by Reams, was the Fifth Quadrennial Review of Military Compensation (QRMC) which found that there were significant differences in income levels which were dependent upon length of service prior to separation of retirement as well as occupation while in the military.

1. Reams (1983)

Reams found that "the average white veteran who entered the military during the Vietnam War and the draft era and completed a tour of duty during the 1960's and 1970's

has not benefitted financially from his post-service employment" [Ref. 2]. Reams used the same National Longitudinal Survey of Young Men Aged 14 to 24 in 1966 as was used in this study. De Tray also used this survey data for part of his work. Reams restricted his research to the 1980 panel of the survey. The major hypothesis that Reams tested was that "the civilian earnings differential from prior military service is a benefit obtained from investment in human capital in much the same as training and job experience are in the civilian sector" [Ref. 2].

The sample used by Reams was restricted to full time members of the workforce. Reams used a cutoff of an average of thirty-five hours a week worked on an individual's current job in the year prior to the 1980 survey. Reams attempted to restrict his investigation of returns to veteran status to single term enlisted personnel. He used a lower bound of eighteen months active duty. As an upper bound, he eliminated all individuals who answered questions asked in 1966, 1971 and 1976 in more than one year, concerning the length of time spent on active duty in the military. Thus any individual who answered this question in more than one year was presumed to have served longer than one term.

Using counterfactual earnings equations, where the equation estimated for one group was used to estimate the earnings of another group, Reams found returns to veteran

status to vary as a function of race. In one comparison of white nonveterans and white veterans, the average profile of a white veteran was used to estimate what his earnings would have been had he been a white nonveteran by using the equation that estimated the returns for white nonveterans. The income level calculated for the white veteran was compared to the average income for the white nonveterans. The procedure was then reversed so that the white nonveteran's characteristics were then used to calculate his income had he been a white veteran. This same procedure was repeated for black veterans and black nonveterans.

In this way, Reams found that white veterans suffered a loss of $971 in yearly wages by virtue of having been a veteran. White nonveterans, on the other hand, were found to have enjoyed a premium of $1,428 from not having served in the military. Both of these estimates were significant to the level of 0.02. Black veterans, on the other hand, were found to enjoy a $2,437 premium over black nonveterans. Black nonveterans had an average loss of $102 from not having served. The latter findings would seem to indicate that blacks benefitted from having served in the military, while whites suffered significant penalties. This runs counter to De Tray's findings.

2. De Tray (1982) & (1980)

De Tray, in both his 1980 RAND paper and his 1982 article in The American Economic Review found that veteran

status, regardless of race, had positive returns. However, his methodology was considerably different from that of Reams [Ref. 4]. Discussion here shall be restricted to his 1980 RAND paper since the 1982 article is drawn from it.

In the first part of his study, De Tray used the 1971 panel of the NLS and estimated returns to veteran status for that group using income observations in 1971 and 1975. He found that veteran status, as a binary variable, had returns of 0.095 in 1971 [Ref. 5: p. 12]. He then differentiated veteran status by length of service, finding that, in general, "veterans with very short terms of service can command a higher 'premium' than veterans who were properly in the military, but the two coefficients are not different at conventional significance levels" [Ref. 5].

In the second part of his analysis, De Tray used the 1960 and 1970 Census Public Use Samples of 1 in 100 people. He stratified them into eleven four year age groups and used a log linear equation to test the hypothesis that "all other things equal, the effect of veteran status on civilian earnings will be a positive function of the proportion of men in a given population who claim veteran status" [Ref. 5]. By and large, for both blacks and whites, the returns were positive and significant.

Two more hypotheses were tested: (1) "Because the quality of schooling varies more for blacks than for whites, veteran status will be a more useful screen for blacks than

for whites" and (2) "Other things being equal, the premium to veteran status will diminish as schooling levels rise" [Ref. 5: p. 26]. Both of these hypotheses were borne out. In the latter, for all four race/census groups, the returns were smaller for those with greater than twelve years of school than for those with less than twelve years of school.

In conclusion, then, returns to veteran status were found by De Tray to be positive. Additionally, veteran status was found to be an apparently useful screening device, especially for blacks and for those with less education. This contrasts strongly with Reams who found that veteran status actually had negative returns using a counterfactual earnings equation. These two works provide a remarkable comparison of how conclusions can differ when diversified approaches to what is essentially the same data and the same problem are used.

3. Fifth QRMC

In January, 1984, the fifth QRMC published its findings. One section (Appendix Q) was devoted to investigating the post-service earnings of veterans. The approach was considerably different than either De Tray or Reams. Indeed, it was quite different than any of the literature that Reams reviewed.

The research pursued the following questions: (1) Do military retirees and separatees earn more or less than comparably aged and educated civilians and working

veterans? (2) Is there a transition period following active service during which retirees and separatees earn appreciably less than they will later in their careers? If so, how long is this transition? What is the magnitude of any reductions in earnings? (3) Does the length of service affect retirees' and separatees' post-service earnings? (4) Does military occupation affect post-service earnings? [Ref. 6].

The data used was garnered from three sources: (1) Internal Revenue Service and Social Security Administration files; (2) Defense Manpower Data Center (DMDC) military personnel separation files; (3) 1980 Census Public Use Microdata Sample (PUMS). Retirees and separatees were identified by specialty (such as combat arms, medicine, etc.), race, length of service at EAOS, time since separation and education level.

Basically, although in much more detail, their findings tended to support those of De Tray. Officers who separated prior to their sixteenth year of service tended to earn more than their civilian counterparts. However, this was not found to be so for enlisted separatees. They earned less if they served longer than four years on active duty. Retirees, regardless of rank, tended to earn less than their civilian counterparts. However, those findings did not include any retirement benefits. The QRMC found that there was a transition period after separation for both officers and enlisted personnel that lasted seven to nine years.

There were also differences by occupational specialty. Those with easily salable skills tended to fare very well [Ref. 6: pp. 101-102].

The longitudinal nature of the data set enabled the QRMC to construct a number of age earnings profiles. These go a long way in supporting the pattern of wage earning described by human capital theory and show that it is a very acceptable mode of investigation for this field.

III. DATA AND METHODOLOGY

A. DERIVATION OF VARIABLES

Almost all of the variables described below are derivations of variables in the National Longitudinal Survey of Young Men aged 14 to 24 in 1966. Two variables, one describing a measure of overall economic activity, GNPGRATE, the other describing levels of unemployment throughout the period, were obtained from statistics compiled by the Organization of Economic Cooperation and Development (OECD) [Ref. 7]. Table I indicates whether or not a variable is time dependent. Some variables such as IQ, ROTTER and RACE will not change over time. Other variables such as DUNCAN or EXPER will change from year to year for an individual. The derivation of each variable is explained below.

AGE: the age of the respondent in a given year which was calculated by adding the number of years between 1966 and the appropriate year to the variable age. For instance, a respondent whose age was 14 in 1966 would have a value of 28 for the variable age for the year 1980.

RACE: a dichotomous variable that delineates the respondents as either black or white. Nonblack and nonwhite respondents were excluded from the data set because their sample size was too small. The value of one was assigned to Whites and the value of two assigned to Blacks.

Table I

Variables by Year

	1966	1967	1968	1969	1970	1971	1973	1975	1976	1978	1980	Not Time Dependent
INCOME	*	*	*	*	*	*	*	*	*	*	*	
ELIGIBLE	*	*	*	*	*	*	*	*	*	*	*	
AGE	*	*	*	*	*	*	*	*	*	*	*	
IQ												*
RACE												*
MARSTA	*	*	*	*	*	*	*	*	*	*	*	
EXPER	*	*	*	*	*	*	*	*	*	*	*	
CIVTRA	*	*	*	*	*	*	*	*	*	*	*	
CITY	*	*	*	*	*	*	*	*	*	*	*	
REGION	*	*	*	*	*	*	*	*	*	*	*	
ROTTER												*
SES												*
HYGRADE	*	*	*	*	*	*	*	*	*	*	*	
YEAR	*	*	*	*	*	*	*	*	*	*	*	
UNION	*	*	*	*	*	*	*	*	*	*	*	
NRDEP	*	*	*	*	*	*	*	*	*	*	*	
DUNCAN	*	*	*	*	*	*	*	*	*	*	*	
CHGDUN	*	*	*	*	*	*	*	*	*	*	*	
VET												*
GNPGRATE	*	*	*	*	*	*	*	*	*	*	*	
CHGUNEMR	*	*	*	*	*	*	*	*	*	*	*	

INCOME: the wages and salary for an individual for the year prior to the observation. This has been adjusted for inflation by use of the Consumer Price Index (CPI).

LINC: the natural logarithm of income.

MARSTA: marital status, which is a dichotomous variable with 0 representing married respondents and 1 representing unmarried respondents.

EMPLOY: represents whether the individual was in the labor force that year and is a component of the variable eligible. There are a number of possibilities for the status of the respondent.

EXPER: an estimate of the number of years a respondent has spent in the workforce. There is, unfortunately, no direct method of calculating this from the data in the NLS. However, using methodology developed by Griliches [Ref. 8], I have imputed the number of years in the workforce by subtracting the number of years of education plus six from the respondent's age in a given year. If the number of years of education is less than eight, I arbitrarily picked age fourteen as a lower cutoff for entry into the workforce. Thus, the maximum value for EXPER is 24 years for a 38 year old in 1980. Veterans time on active service (AFMOS) is not counted and has been subtracted from EXPER.

XBT: is exp(-.1*EXPER), or, 2.71 raised to a power equivalent to the product of -0.1 and EXPER. This was derived from Griliches [Ref. 8].

TENURE: is the number of years that a respondent has spent at his current job. For years 1966 to 1969, it was calculated by subtracting the year and month in which the current job was started from the particular year. June was arbitrarily selected as the interview month. If tenure were zero in any one of those years, then tenure equaled the previous year's tenure plus one. For 1970, 1971, 1973 and 1975, TENURE was imputed. There was a question asked in 1975 that ascertained if employment began at the current job prior to 1971. If so, then TENURE for those years was calculated as TENURE69 plus the difference in years between 1969 and the particular year. If the answer was "no," TENURE for the particular year was calculated as TENURE76 less the difference in years between 1976 and the particular year. If the value was less than zero, it was set to zero. For 1976 and later, TENURE was calculated in the same manner as 1966 to 1969.

PASTEXP: is the difference between EXPER and TENURE. The minimum value is zero.

CIVTRA: This variable is derived from a question asking: did the respondent complete a vocational training course in the last year? If the respondent answered "yes," he would have a value of zero for CIVTRA. To capture the concept that vocational training has an effect over a greater period than one year, a respondent was counted as having a training course if he completed prior to the year of the observation.

Essentially, CIVTRA ascertains whether or not an individual had completed a training course at any point prior to the given year.

CITY: Ascertains whether an individual lived in a standard metropolitan Statistical Area. If the answer was yes, then the respondent had a value of 0 for this variable. If the answer was no, he had a 1.

REGION: two part variable ascertaining whether the individual lived in the South. If he did so, he had a value of 1. If not, he had a value of 0.

ROTTER: variable measuring an individual's orientation of control. The lower an individual's score on the test (the range is from 11 to 42), the more control he or she feels that they have over the events in their lives. Thus, an individual with an internal locus of control would feel that doing a good job is dependent upon his or her actions, not those of some external agent.

SES: variable measuring socioeconomic status that was derived by the Human Resources Center at Ohio State University. Its components include father's income, father's duncan, availability of reading material and both parent's level of education.

HYGRADE: level of education. This is a cumulative variable that is derived from a question asked in each year where observations were made which ascertained the number of years of education an individual had completed.

YEAR: a marker variable used to denote the year of the observation.

UNION: was the respondent a member of an employee's association or collective bargaining unit in the year indicated. In 1967, 1970, and 1975, the question was not asked. In that case, the year immediately after was used to fill the hole. This allowed use of the variable. Missing responses were coded as not belonging to a union, or zero. Persons reporting themselves belonging to a union were coded as one.

NRDEP: indicates the number of dependents that the respondent had, not including his wife.

HEALTH: did the respondent have health problems that prevented him from working part or all of the period since the last interview. If the answer is yes, the value for the variable is 0.

ELIGIBLE: Is the member an eligible member of the data set. The criteria are (1) member of the labor force and (2) did not receive either unemployment compensation in the last year.

LINC: is the natural logarithm of income.

DUNCAN: is the duncan index of the respondent's current job.

CHGDUN: is the father's duncan index as of 1966 less the son's duncan index of the particular year.

VET: indication of veteran's status. It is divided into three ways, those who served over eighteen months, those who served zero to eighteen months and those who did not serve at all.

AFMOS: number of months the respondent served in the armed forces. Served as a basis for derivation of the previous variable.

AFPRITRN: did the respondent receive vocational training while in the armed forces?

XPQUAD: EXPER + SQ(EXPER).

WKSWK: number of weeks the individual worked in the previous year. Additional cutoff to be used in determining eligibility. Not, however, a part of the variable ELIGIBLE.

GNPGRATE: is the change in growth rate of GNP for a given year as compared to the base year of 1966. The growth rates were calculated in constant 1975 dollars using data from OECD.

CHGUNEMR: is the unemployment rate in 1966 less the unemployment rate in the year of the observation. Table II summarizes the definitions of all the variables.

B. METHODOLOGY

1. Determination of Eligibility Criteria

The algorithm for determining eligibility for inclusion in the workforce was based upon whether or not the respondent, in any given year, was a full time member of the

workforce and at least eighteen years of age. This last requirement was used since most people do not obtain full-time jobs prior to that age. This was determined by three steps. The first was whether or not the individual considered himself a member of the workforce in a given year. If the respondent responded yes, he was kept. If not, he was dropped. There were any number of reasons as to why he did not consider himself in the workforce: in school, not healthy, in the military etcetera. Any persons less than eighteen were also dropped.

In the second step, the respondent was asked whether or not he received unemployment benefits at any point in the preceding year. If he had not, he was included. The logic behind this step was that the preceding question had asked the respondent what his eligibility was in the interview week. This question asked about the entire previous year. The third step determined the number of weeks in the previous year the respondent had worked. The minimum cutoff was 38 weeks. It was set at that level in order to include seasonal workers who would tend to accrue the mass of their earnings over a period considerably shorter than a year, but live on those earnings over the entire year. An example of this would be a teacher who may work only nine months a year (about 36 weeks), but would subsist on those earnings throughout the entire year.

The fourth step was necessary in order to eliminate spurious income observations. Despite the three previous steps, there were still a significant number of respondents who listed their wages and salary as zero for the preceding year. Indeed, in most years, it was the modal value even when the data set had been restricted by the previous three steps. In order to correct this, a reasonable minimum income was determined to be $1,500 per year. This was calculated by taking a $1.00 per hour wage (somewhat less than the $1.30 minimum wage for 1967) in 1967 dollars and multiplying by a forty hour work week for thirty-eight weeks. This worked out to $1,520 per year. This was arbitrarily rounded down to $1,500. This floor was kept constant for each year because the income observations are in constant dollars pegged to the value of the 1967 dollar.

2. Adjusting Coefficients of Nonlinear and Dichotomous Variables

Halvorsen and Palmquist [Ref. 9] maintain that, in a log-linear equation such as is used here, the coefficient calculated for a dichotomous variable does not accurately represent the effect of this variable upon the dependent variable. A transformation of the following equation must be made:

$$g=\exp(c) -1 \qquad \text{(eqn 3.1)}$$

The results presented in Table VIII and all subsequent tables for dichotomous variables are the actual coefficients, not the transformed results.

For the variable XBT, which was calculated as follows:

XBT=exp(-0.1 * EXPERIENCE) (eqn 3.2)

the value presented in the tables is the actual coefficient, not the transformed value that represents the impact of an additional year of membership in the workforce. The transformation of the coefficient in the equation into a percentage effect of an additional year of experience for a particular observation is calculated as follows:

%effect=(B*(XBT)*-0.1)*100 (eqn 3.3)

During the discussion of the findings, any references to adjusted coefficients are drawn from Appendix B.

An estimation of the dollar effect of a variable on income must be made since the log of income is nonlinear. The estimation is as follows:

$effect=income - exp(ln(income)+(B*(value))) (eqn 3.4)

3. Development of the Equation

a. The Dependent Variable

The natural logarithm of wages and salary was used since it has been well-established [Ref. 2] that this most closely approximates the growth of an individual's income over his or her lifetime. Because of the vagaries involved in the variables concerning professional and

personal business income, and the fact that they could involve losses and potentially misleading data, only wages and salary were used.

b. The Independent Variables

XBT was found to have the highest degree of contribution the coefficient of determination of a regression equation predicting the natural log of income. Age was not included as a variable since there was a great deal of collinearity between it and experience. IQ was also eliminated because of the number of missing values as well as the degree of collinearity between it and socioeconomic status. Griliches [Ref. 8] decries the lack of a measure of general ability. IQ is the only variable that even comes close to this description in this data set and its deficiencies have been debated for years. However, if observations that had valid IQ scores were used exclusively, an unacceptable degree of bias would be introduced because there is a higher proportion of Blacks with IQ a missing value than there is of Whites. In chapter V, a brief investigation is made of whites only in order to ascertain that there is no selection bias present with regard to veteran status, using IQ as a proxy for ability. The variables listed in Table II are the ones used in the general equation discussed in chapter IV.

Table II

Variables Used in General Equation

Dependent Variable

LINC:	natural logarithm of income

Independent Variable

XBT:	exp(-.1 * EXPERIENCE)
RACE:	whether or not an individual is Black or White
VET:	did respondent serve in military?
SES:	socioeconomic status
CIVTRA:	was civilian vocational training course completed?
DUNCAN:	job status
CHGDUN:	change in DUNCAN from father in 1966 to son in year of observation
ROTTER:	degree of internal/external orientation
REGION:	South versus nonsouth
CITY:	whether respondent lived in an SMSA or not
HYGRADE:	number of years of education
UNION:	whether or not respondent was a member of a union or not
NRDEP:	number of dependents excluding wife
GNPGRATE:	indicator of economic activity
CHGUNEMR:	availability of jobs

c. How the Analysis was Performed

The data was analyzed in three phases. In the first phase, which consisted of three steps, the block regression package provided by the Statistical Analysis System was used on a data set which consisted of observations pooled from each of the eleven years in which the survey was conducted. The second step of this phase was a disaggregation of the data set, first by race and then by veteran's status. The third step was a disaggregation by race and veteran's status at the same time. The first two sections of chapter IV present the findings.

The second phase was a disaggregation of the pooled data set by year, using the block regression procedure supplied by SAS. There are eleven regression equations produced by this analysis, one for each year. The second step of this phase disaggregated the data sets of each individual year, first by race and then by veteran's status. The results can be compared to the findings of the pooled data set. The findings from this phase are contained in the third section of chapter IV. The third phase disaggregated the data set in each individual year by race and veteran's status at the same time.

However, the equations are somewhat different in this section. Because sample sizes are so small in the individual years, especially for Black veterans (n=121 for 1980, for example), the results for many of the variables

are statistically insignificant when the block procedure is used to estimate the equations. Therefore, they were estimated using the stepwise procedure in SAS where the minimum tolerance for the probability of the coefficient being greater than zero is 5%. Thus, the results will not be strictly comparable to the first three sections where the equations were estimated using the block regression procedure. The problems encountered in section three illustrate the dangers of cutting a data set into finer and finer blocks. Griliches said that "The amount of information contained in any one specific data set is finite, and therefore, as we keep asking finer and finer questions, our answers become more and more uncertain" [Ref. 8]. This is a point to be kept in mind in interpreting the next section which presents the highlights of the summary descriptive statistics of each of the groups described above.

C. DESCRIPTIVE STATISTICS

1. Overview

Table III presents the profile of the aggregate pooled cross-sectional time-series data set. Appendix A contains the summary statistics for the data set for 1966 and 1980. Within the aggregate data set, there are 21,268 observations assembled from observations drawn eleven years between 1966 and 1980. Approximately 21.4% of the respondents are Black while 28.4% of the aggregate sample are

Table III

Summary Statistics for Pooled

Time-Series/Cross-Sectional Data Set

Variable	N	N Missing	Mean	Min	Max
EXPER	21268	0	6.94	0	24
XBT	21268	0	.546	.091	1
IQ	14900	6368	101.50	50	158
HYGRADE	21268	0	12.74	0	18
SES	19916	1352	100.20	21	158
ROTTER	16851	4417	22.21	11	42
INCOME	21268	0	6762.16	1503.15	45550.00
CIVTRA	21268	0	.557	0	1
DUNCAN	21126	142	40.47	0	96
CITY	21285	83	.290	0	1
REGION	21185	83	.399	0	1
MARSTA	20883	385	.369	0	1
UNION	21268	0	.257	1	2
NRDEP	20491	777	1.18	0	9
VET	21268	0	.284	0	1
RACE	21268	0	1.214	1	2

veterans. The sample size for 1966 is 1960, or about 5% of the total. Sample size increases by 150 to 250 observations per year over the next several years until 1971. In 1973, sample size jumps by almost 20% over 1971 to 2,640. It is the year with the most observations. Each of the next four years has a sample size between 2,445 (1978) and 2,236 (1980). The aggregate sample, therefore, is somewhat biased in the number of observations towards the last five years of observations. This is to be expected as the sample grows older and more of the respondents finish their education and military service and enter the workforce.

Most of the heavily time-dependent variables tend to follow this pattern. Experience, which is, on average, 6.94 years for the aggregate sample, is 3.80 years in 1966. It increases slowly through the 1960's and early 1970's. This pattern is broken in 1976, but is resumed through the last two years of observations. HYGRADE shows a similar although less radical pattern. In 1966, the average number of years of education is 11.56 (versus 12.74 for the sample). This increases slowly but steadily in every year to 13.64 years of formal education in 1980.

The sample stays relatively stable throughout the period in terms of the proportion of people living in a standard metropolitan statistical area (SMSA) versus those living in more rural areas. Twenty-nine percent of the

aggregate sample are in an SMSA. The proportions in the individual years are between 27 and 29%. A very slight rise in the proportion of the sample that lives in the South can be detected over the years when compared to the proportion of those who do not live in the Souty. This is concomitant with a slight rise in average income of those living in the South as compared to living elsewhere. This will be discussed in the next chapter in more depth. Overall, 39.9% live in the South.

2. Noteworthy Differences and Similarities by Race

Tables IV and V present the summary statistics for the aggregate sample separated by race. As mentioned above, about 21.4% of the aggregate sample is Black. The proportion of Blacks in each year varies from 20.4% in 1966 to about 23.4% in 1973. From 1975 on, the proportion of Blacks in the sample is somewhat lower than in the earlier years, staying between 20 and 21%. There are some distinct differences between the Blacks in the sample and the Whites in terms of average income, socioeconomic status and IQ. Blacks tended to earn significantly less, on average, than did Whites in comparable years. For the sample as a whole, Blacks earned an average of $5,022 compared to Whites who earned on average $7237. There were similar disparities in socioeconomic status: 81.70 for Blacks in the aggregate sample and 104.86 for Whites. These disparities held fairly constant throughout the entire period.

Table IV

Aggregate Sample: Whites

Variable	N	N Missing	Mean	Min	Max
EXPER	16707	0	6.65	0	24
XBT	16707	0	.5602	.0972	1
IQ	12940	3767	103.79	50	158
HYGRADE	16707	0	13.12	0	18
SES	15926	781	104.86	22	158
ROTTER	13249	3458	21.74	11	42
INCOME	16707	0	7237.10	1503.15	45550
CIVTRA	16707	0	.522	0	1
DUNCAN	16587	120	44.17	0	96
CITY	16653	54	.283	0	1
REGION	16653	54	.317	0	1
MARSTA	16419	288	.344	0	1
UNION	16707	0	.249	0	1
NRDEP	16140	567	1.11	0	9
VET	16707	0	.311	0	1
RACE	-	-	-	1	2

Table V

Aggregate Sample: Blacks

Variable	N	N Missing	Mean	Min	Max
EXPER	4561	0	7.97	0	24
XBT	4561	0	.483	.091	1
IQ	1960	2601	86.32	50	127
HYGRADE	4561	0	11.37	0	18
SES	3990	571	81.70	21	155
ROTTER	3602	959	23.96	12	42
INCOME	4661	0	5022.46	1504.00	31050.00
CIVTRA	4561	0	.690	0	1
DUNCAN	4539	72	26.87	0	93
CITY	4532	79	.297	0	1
REGION	4532	79	.700	0	1
MARSTA	4464	91	.461	0	1
UNION	4561	0	.288	0	1
NRDEP	4351	210	1.434	0	9
VET	4561	0	.186	0	1
RACE	-	-	-	1	2

Income, on average, rose each year for both groups. In 1966, the average income for the sample was $5,109 ($5,487 for Whites and $3,630 for Blacks). This rose by 2% to 5% a year for both groups until 1978. There was a precipitous drop of almost 10% in real income between 1978 and 1980 ($8,065 in 1978 to $7,256 in 1980). As was discussed earlier, these income figures are in constant 1967 dollars as adjusted by the Consumer Price Index. Thus, any results from analysis of the 1980 sample as must be viewed with a degree of caution, for the pattern of steadily rising income was broken for the first time since the survey began some fourteen years before.

Blacks tended to have spent more time in the work-force, overall, than did Whites (7.97 years compared to 6.65 years). Concomitantly, they tended to have less years of education than did Whites (11.4 years versus 13.1 years). This pattern was consistent throughout the period of the survey. Whites had, on average, more years of education than did Blacks in 1966 (11.9 years versus 10.3). The same edge was apparent in 1980: 13.98 years for Whites and 12.33 for Blacks. The pattern of experience was also consistent. Blacks in every year had, on average, spent more time in the labor force.

A lower proportion of Blacks completed a civilian vocational training course as compared to Whites. Thirty-one percent of the Blacks in the aggregate sample had done so as

compared to 48% of the Whites. In both groups, this proportion was very low in the early years and tended to grow quite steadily through the years. A slightly higher proportion of Blacks belonged to unions than did Whites. This did not vary over the period to any significant degree.

Some 32% of the Whites in the aggregate sample had served in the military as compared to just 19.4% of Blacks. This is confirmed by the proportion of Black veterans being much lower than that of Black nonveterans. In conclusion, the Black sample, whether in the aggregate or in any of the individual years, tended to present a quite different profile than the White sample. This phenomenon was quite apparent in the findings of the regression equations which are presented in the next chapter.

3. Noteworthy Differences and Similarities by Veteran's Status

The proportion of veterans in the sample increases in the later years to about 33.8% in 1980 as compared to between 27 and 30% in the earlier years. The differences between veterans and nonveterans are much less pronounced than those observed between the races. One major reason for this is the definition of veteran's status. Veterans, on average, seem to have spent less time in the workforce than have nonveterans (6.2 years versus 7.2 years), yet have no more education, on average (12.93 years versus 12.66 years). This pattern remains quite consistent throughout

the period of the survey. In 1966, the average veteran had 2.6 years of experience in the workforce and 11.8 years of school as compared to the nonveteran having 4.2 years of experience and 11.5 years of education. Even in 1980, veterans tended to have less years of experience in the workforce, presumably due to their military service: 12.8 years of experience for the veterans compared to 12.4 years for the nonveterans and 13.66 years of education for veterans compared to 13.64 years for nonveterans.

Somewhat more veterans received civilian vocational training than did nonveterans (53% versus 41%) in the aggregate sample. The proportion of both groups completing a civilian vocational training course increases over the years: from about 5% in each group in 1966 to 77% of veterans and 67% of nonveterans in 1980. Income patterns are very similar between the groups throughout the years with veterans having earned, on average, about $200 to $500 more a year than nonveterans. However, this is well within the standard deviation from the mean for both groups. Both groups experienced the same growth patterns in income that were discussed above: steady growth through 1978 and a precipitous drop in 1980.

There was a somewhat lower proportion of Black veterans than there were Black nonveterans (14% versus 24.6%). This may account for lower proportion of veterans living in the South (34.3%) as compared to nonveterans

Table VI

Aggregate Sample: Veterans

Variable	N	N Missing	Mean	Min	Max
EXPER	6042	0	6.23	0	23
XBT	6042	0	.575	.100	1.00
IQ	4825	1217	100.73	51	148
HYGRADE	6042	0	12.93	6	18
SES	5753	289	102.66	36	156
ROTTER	3909	2133	21.34	11	42
INCOME	6042	0	7188.83	1504.00	89302.00
CIVTRA	6042	0	.476	0	1
DUNCAN	5991	51	41.94	0	96
CITY	6028	14	.254	0	1
REGION	6028	14	.343	0	1
MARSTA	5930	112	.360	0	1
UNION	6042	0	.870	1	2
NRDEP	5859	183	1.114	0	9
VET	-	-	-	0	1
RACE	6042	0	1.140	1	2

Table VII

Aggregate Sample: Nonveterans

Variable	N	N Missing	Mean	Min	Max
EXPER	15226	0	7.21	0	24
XBT	15226	0	.535	.0907	1
IQ	10075	5207	101.88	50	158
HYGRADE	15226	0	12.67	0	18
SES	14163	1070	99.21	21	158
ROTTER	12942	2311	22.48	11	41
INCOME	15226	0	6592.86	1503.00	39696.85
CIVTRA	15226	0	.588	0	1
DUNCAN	15226	92	39.89	0	93
CITY	15157	69	.304	0	1
REGION	15157	69	.421	0	1
MARSTA	15953	275	.372	0	1
UNION	15226	0	.252	1	2
NRDEP	14632	594	1.208	0	9
VET	-	-	-	0	1
RACE	15226	0	1.246	1	2

living in the South (42.1%). These differences remain constant throughout the period of the survey. The proportion of veterans living in the South grew from 1966 to 1980, as did the proportion of the overall group and the proportion Whites in the same period.

There were few other differences of note between veterans and nonveterans. As will be seen in the next chapter, the returns to veteran's status for all groups tended to bear out the patterns discussed here.

IV. GENERAL EARNINGS EQUATIONS: RESULTS BY YEAR, RACE AND VETERAN STATUS

The results of the regression equations using the form discussed in the previous chapter are presented in this chapter. The general form of the equation is:

$$\ln \text{income} = B(0) + B(XBT) + B(RACE) + B(IQ) \quad \text{(eqn 4.1)}$$
$$+ B(CIVTRA) + B(HYGRADE) + B(DUNCAN) + B(NRDEP) + B(CHGDUN)$$
$$+ B(CITY) + B(REGION) + B(MARSTA) + B(UNION) + B(SES) +$$
$$B(ROTTER + B(CHGUNEMR) + B(GNPGRATE)$$

The first section if this chapter presents the findings using a pooled time-series cross-sectional approach. This is done in four subsections: (a) aggregate (b) by veteran status, (c) by race, (d) by race and veteran status. The second section presents the results of this equation for each of the eleven years in which observations were recorded. The variables GNPGRATE and CHGUNEMR are not included in the analysis in the second section since their values are the same for all observations in a given year. Section three presents the estimates of earnings equations for black veterans, black nonveterans, white veterans and white nonveterans by year. Because sample sizes are so small in the individual years, especially for black veterans

(n=121 for 1980, for example), the regression coefficients for many of the variables are statistically insignificant when the variables entered the regression equation as a block. Therefore, the earnings equations were estimated using a stepwise procedure where the minimum tolerance for the probability of the coefficient being greater than zero of 5%. Thus, the results are not to be strictly comparable to the first two sections.

A. POOLED TIME-SERIES CROSS-SECTION RESULTS

1. Aggregate Results

As shown in Table VIII, the most striking result from estimating this equation on the pooled time-series cross-sectional data set is that fifteen of the sixteen variables are significant at the 0.0001 level. CHGDUN (the change in job status from father to son) is the only variable that is not significant. Table VIII seems to indicate that, for this group of Vietnam era men, there were positive returns associated with having served in the armed forces on a noncareer basis. As will be seen later in chapter V, this finding is dependent upon the definition of veteran status as well as the definition of experience in the workforce. For the purposes of this chapter, an individual was classified as a veteran if he spent as little as one month on active duty.

Table VIII

General Equation: Pooled Cross-Sectional Time-Series

Variable	Regression Coefficients General	Vet	Nonvet	White	Black (1)
XBT	-0.640	-0.445	-0.729	-0.704	-0.320
RACE	-0.165	-0.151	-0.167	NA	NA
VET	0.076	NA	NA	0.077	0.049
CIVTRA	-0.069	-0.059	-0.071	-0.060	-0.087
HYGRADE	0.042	0.037	0.045	0.042	0.038
DUNCAN	0.004	0.005	0.004	0.004	0.004
CHGDUN	0.0000	0.000	0.000	0.000	0.000
	(0.4993)	(0.0916)	(0.0704)	(0.8055)	(0.9364)
GNPGRATE	1.717	1.680	1.654	1.796	1.466
CITY	-0.131	-0.106	-0.139	-0.125	-0.132
REGION	-0.090	-0.077	-0.095	-0.070	-0.166
MARSTA	-0.115	-0.100	-0.119	-0.122	-0.091
UNION	0.166	0.171	0.163	0.160	0.175
SES	0.001	0.001	0.001	0.001	0.001
ROTTER	-0.004	-0.004	-0.004	-0.004	-0.003
					(0.229)
CHGUNEMR	-0.010	-0.013	-0.006	-0.007	-0.025
		(0.0006)	(0.0077)	(0.0022)	
NRDEP	0.029	0.038	0.025	0.039	0.012
					(0.0025)
RSQUARE	0.427	0.325	0.450	0.368	0.421
N	21268	6042	15226	16707	4562
D-W (2)	1.896	1.961	1.869	1.886	1.824

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.

(2) Durbin-Watson statistic for each equation.

The variable with the largest coefficient is experience. The effect on income of an additional year of experience at the mean number of years of experience (6.94) is $214. For the maximum number of years of experience recorded (24), the effect of an additional year of experience declines to $39.

Living in a standard metropolitan statistical area (CITY) had a somewhat larger positive effect upon income than does living outside the South. On average, the former had a premium of $885 attached to it, the latter a premium of $607. Belonging to a union has a somewhat larger positive effect upon income ($1,161).

The Rsquare of this equation is 0.427. Despite the significance of fifteen variables in this equation, there is still a large amount of variation in earnings that is not accounted for in this earnings function model.

2. Veterans versus Nonveterans

Table VIII also shows that, for both veterans and nonveterans, every variable except CHGDUN and CHGUNEMR is significant at the 0.0001 level. This characteristic of a large number of highly significant coefficients of variables is very similar to the general equation. There are several areas in which the returns differ to a significant degree from the aggregate earnings equation. In the first, veterans seem to have had a smaller return to an additional year of experience in the workforce: $240 for nonveterans

versus $157 for veterans. The income penalty associated with race was about the same for both groups ($1,080 for veterans versus $1,083 for nonveterans). Nonveterans who were city dwellers (living in a standard statistical metropolitan area) enjoyed a larger income premium over their rural brethren ($915) than do veterans who live in an SMSA over veterans who did not live in an SMSA ($763).

The most striking difference between the two equations comes in the comparison of the coefficient of determination (R(2)). The estimated earnings equations do a much better job of accounting for the differences in income of nonveterans than for veterans (0.450 versus 0.325 respectively). The differences may be due to the absence of variables from the equation that would tend to account for the special circumstances surrounding service in the military. Veterans may have a less traditional pattern of acquisition of human capital than nonveterans in that they may tend to return to school after military service at a point in life when many nonveterans are in the workforce. Also, there are no variables in the equation accounting for training or other human capital acquired during military service. This issue will be explored in some more depth in the next chapter.

3. Earnings Equations by Race

As Table VIII shows, Blacks have returns to an additional year of experience that were considerably lower than

for either Whites or the sample as a whole. On average, Whites benefited by $267 for an additional year of experence compared to Blacks benefiting only $73. These figures were calculated for the average number of years of experence and the average salary. With regard to the effect of race on income, being Black had a negative impact of $1,110 on income, on average, when the coefficient has been adjusted by Halvorsen and Palmquist's formula [Ref. 9].

Within the pooled time-series cross-sectional data set, Whites have larger positive returns to veteran status than do Blacks (0.080 versus 0.050 respectively). This translates into income premiums of $602 and $205 for White and Black veterans respectively. This finding of highly significant positive returns to veteran status for both Blacks and Whites during the Vietnam era stands in some contrast in the findings of previous works [Refs. 2, 3]. As Table VIII shows, this leaves CHGDUN as the only variable that is not significant at the 0.0001 level for Whites. For Blacks, the only variables not significant to that level are CHGDUN, ROTTER and NRDEP. Of those, only CHGDUN is not significant at the 0.05 level.

Blacks apparently suffered a much larger penalty for living in the South than do Whites. The negative effect on income for Blacks was $830 as compared to the impact on Whites of $509. As would be expected, a far higher

proportion of Blacks lived in the South than do Whites (70% of the Blacks lived in the South as compared to just 31% of the Whites). By contrast, the CITY effect is smaller on Blacks than it is upon Whites ($663 versus $906 respectively). This pattern repeats itself throughout this chapter. The only other difference by race that is interest is that of Whites who belong to a collective bargaining association enjoying a wage premium of $1,375 as compared to Blacks who enjoyed a premium of only $1,057.

The Rsquare of the equation for the Black sample is 0.421 as compared to the White sample Rsquare of 0.368. Interestingly, both of these Rsquares are less than that of the total group. Contrary to Reams' [Ref.1] finding that a linear equation did a better job of predicting the earnings of Blacks, the log-linear equation did a creditable job in accounting for the variation in income of Blacks. As will be explained further in subsequent sections of this chapter, the findings in Table VIII are based upon eleven years of observations while Reams' findings were based upon only the last year. There may well be systematic variations from year to year that can influence findings to a large degree but which are not accounted for in estimates of equations that use data from a single year.

4. Earnings Equations by Race and Veteran's Status

This section develops estimates of earnings equations for groups defined by both race and veteran status.

The trends noted in the previous two sections of this chapter for the more aggregate groups are seen again in Table IX. Returns to experience continues to be larger for Whites as compared to Blacks. There are also differences between Black veterans and Black nonveterans and White veterans and White nonveterans respectively. Black veterans tended to have returns to experience that were not at all significant. Black nonveterans had higher returns, but they were considerably lower than those for Whites in general. White veterans tended also to have lower returns to experience than did White nonveterans.

Returns to living in an SMSA (CITY) were generally larger than those of not living in the South. This was true for all groups except Black nonveterans. For instance, White veterans who lived in an SMSA enjoyed a $745 premium over those who lived in more rural areas. This is compared to a premium of $501 to those white veterans who did not live in the South. White nonveterans exhibit a similar pattern with returns to CITY and REGION of $657 and $500 respectively. Black veterans, on the other hand, tended to have smaller premiums for not living in the South than did Black nonveterans, having premiums of $697 and $578 respectively. Black nonveterans had returns of $663 and $918 to the two variables, being the only group to break the pattern of larger returns to CITY than to REGION.

Table IX

General Equation: By Race and by Veteran Status

Variable	Regression Coefficients Black Vet	Black Nonvet	White Vet	White Nonvet
XBT (1)	-0.007	-0.409	-0.507	0.799
	(0.9249)			
RACE	NA	NA	NA	NA
VET	NA	NA	NA	NA
CIVTRA	-0.093	-0.084	-0.055	-0.060
	(0.0011)			
HYGRADE	0.035	0.041	0.038	0.045
DUNCAN	0.005	0.004	0.005	0.004
CHGDUN	0.001	0.000	-0.000	0.000
	(0.5202)	(0.8904)	(0.0410)	(0.2857)
GNPGRATE	1.724	1.318	1.610	1.794
	(0.0003)			
CITY	-0.139	-0.132	-0.103	-0.133
REGION	-0.115	-0.181	-0.069	-0.070
MARSTA	-0.129	-0.081	-0.093	-0.132
UNION	0.229	0.165	0.165	0.158
SES	0.002	0.001	0.001	0.002
	(0.0201)		(0.0017)	
ROTTER	0.003	-0.003	-0.005	-0.004
	(0.4668)			
CHGUNEMR	0.022	-0.022	-0.010	-0.004
	(0.0176)		(0.0002)	(0.1587)
NRDEP	0.013	0.011	0.041	0.036
	(0.2465)	(0.0127)		
RSQUARE	0.300	0.422	0.303	0.390
N	847	3714	5195	11512
D-W (2)	1.885	1.848	1.937	1.872

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.
(2) Durbin-Watson statistic for each equation.

B. GENERAL EQUATION BY YEAR

There are two elements of interest in analyzing the changes in the regression coefficients over time: the first is that the sample population is growing older. In 1966, the ten cohorts ranged from fourteen to twenty-four years in age, where most of the respondents were not in the work-force. This is reflected by the sample sizes for each year. In 1966, there were only 1,060 respondents meeting the criteria of being full-time members of the workforce, representing less than 20% of the original sample. By 1980, that number had more than doubled to 2,236, where the age range was from twenty-eight to thirty-eight. As a result, this longitudinal data represents a unique chance to measure the effects of investment in human capital over a period of time. This allows one to see whether or not the theory of human capital helps explain income variations of the same set of individuals over time. The second major change from the previous discussion is the evolution of the economy over time. In the general form of the equation, GNPGRATE measured the change in growth of the GNP from year to year relative to a base year of 1966. There are no equivalent variables measuring the level of economic activity in the estimates of the equations for each year. Table X presents the results of the general equation by year.

Griliches points out [Ref. 8] that XBT, being nonlinear, presupposes a declining return for each additional year of

Table X

General Equation by Year: 1966-1971

	Regression Coefficients					
Variable	1966	1967	1968	1969	1970	1971
XBT(1)	-0.695	-0.697	-0.870	-.794	-0.862	-0.864
RACE	-0.245	-0.150	-0.151	-0.155	-0.140	-0.137
VET	0.098	-0.128	0.117	0.099	0.113	0.093
CIVTRA	-0.042	-0.071	-0.066	-0.090	-0.069	-0.102
	(0.3656)	(0.0519)	(0.0060)		(0.0007)	
HYGRADE	0.041	0.043	0.057	0.034	0.046	0.047
DUNCAN	0.003	0.002	0.003	0.005	0.004	0.005
	(0.0008)	(0.0028)				
CHGDUN	-0.000	0.002	-0.000	0.000	0.001	0.000
	(0.6968)	(0.0177)	(0.4576)	(0.8542)	(0.0940)	(0.7641)
CITY	-0.135	-0.111	-0.148	-0.148	-0.149	-0.113
REGION	-0.150	-0.179	-0.126	-0.122	-0.104	-0.102
MARSTA	-0.196	-0.141	-0.168	-0.154	-0.160	-0.126
UNION	0.112	0.136	0.160	0.186	0.216	0.203
SES	0.001	0.002	0.001	0.001	0.001	0.001
	(0.1054)	(0.0245)	(0.0922)	(0.2146)	(0.0247)	(0.3948)
ROTTER	-0.004	-0.007	-0.005	-0.003	-0.002	-0.001
	(0.0879)		(0.0005)	(0.0109)	(0.0936)	(0.2171)
(0.7942)						
NRDEP	0.014	0.039	0.017	0.017	0.014	0.020
	(0.2651)		(0.1108)	(0.0631)	(0.1328)	(0.0147)
RSQUARE	0.361	0.399	0.416	0.433	0.424	0.460
N	1060	1213	1416	1646	1825	2091
D-W (1)	1.849	1.911	1.818	1.856	1.908	1.919

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.

(2) Durbin-Watson statistic for each equation.

Table XI

General Equation: 1973-1980

Variable	Regression Coefficients 1973	1975	1976	1978	1980
XBT	-0.697	-0.692	-0.671	-0.628	-0.730
RACE	-0.144	-0.182	-0.148	-0.152	-0.183
VET	0.076	0.074	0.072	0.058	0.060
				(0.0005)	(0.0006)
CIVTRA	-0.063	-0.044	-0.056	-0.080	-0.072
		(0.0053)	(0.0005)		
HYGRADE	0.050	0.053	0.054	0.049	0.044
DUNCAN	0.004	0.003	0.005	0.004	0.005
CHGDUN	0.000	0.001	-0.000	-0.000	-0.000
	(0.4079)	(0.3492)	(0.4457)	(0.4305)	(0.4770)
CITY	-0.097	-0.130	-0.120	-0154	-0.148
REGION	-0.089	-0.063	-0.076	-0.050	-0.033
					(0.0609)
MARSTA	-0.160	0.086	-0.110	-0.151	-0.118
UNION	0.169	0.148	0.160	0.169	0.131
SES	0.002	0.002	0.001	0.001	0.002
	(0.0002)	(0.0004)	(0.0202)	(0.0128)	
(0.0002)					
ROTTER	0.004	-0.005	-0.004	-0.006	-0.001
	(0.0237)	(0.0057)	(0.0257)	(0.0002)	(0.4904)
NRDEP	0.024	0.030	0.029	0.028	0.028
RSQUARE	0.424	0.384	0.405	0.375	0.390
N	2605	2428	2303	2445	2236
D-W (1)	1.933	1.954	1.968	1.999	1.903

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.

(2) Durbin-Watson statistic for each equation.

experience. The results presented in section A of this chapter confirm that assertion. In 1966, the mean years of experience in the workforce was just 3.8 year. The return to an additional year of experience was $251. This premium increased through the 1960's as average experience climbed only slightly and average income climbed fairly rapidly. In 1968, the return to an additional year of experience was $321. This declined steadily throughout the rest of years with only two perturbations. By 1980, the return to an additional year of experience was only $168. That it is that high is largely a function of the increase in income over the years. Average income in 1980 is over $2,000 higher than average income in 1966.

As Table III shows, the earnings premium associated with being White steadily declined from 1966 ($1,238) until 1971 ($850) and then increased from 1971 until 1975 ($1,336), where it was higher than at any time since the survey began. This would seem to suggest that many of the economic gains made by Blacks during the 1960's were steadily erased by the recessions experienced during the early to mid 1970's. Indeed, the steadily increasing general unemployment rate (OECD) during the late 1960's and early 1970's would tend to confirm this. The premium again dipped in 1976 ($1,094) before climbing again. In 1980, the premium was $1,181.

The returns to being a veteran were clearly positive in every year of the survey, although the magnitude of the

coefficients, and hence the returns, tended to decline after 1971. During the 1960's, the premium climbed steadily from 1966 ($554) to 1970 ($784). By 1980, the positive return had declined to $518.

The advantage gained from having completed a civilian vocational training course grew steadily from 1966 to 1971 (-0.041, adjusted to -0.097, adjusted) with fluctuations in 1967 and 1969. However, from 1973 to 1976, there was a decline in returns (-0.079 to -0.054, adjusted) with a brief upswing in 1978. The pattern suggested resembles the relative change in unemployment rates in each year with respect to the 1966 unemployment rate (CHGUNEMR). However, when the condition index was examined, there was no sign of collinearity between the two variables.

The earnings premium associated with living in a Statistical Metropolitan Area (CITY) did not exhibit any particular trend in the sample as a whole. In each year the coefficient was statistically significant at a level of 0.01. The premium associated with not living in the South, on the other hand, showed a steady decline throughout the period. This is compatible with the economic resurgence of the old South during the 1960's and 1970's.

Being a member of a union had a consistently sizeable positive return in almost every year.

For the general equation by year, the coefficient of determination varies from 0.361 in 1966 to 0.424 in 1970.

At the same time, sample size increased steadily to a peak of 2,605 in 1973. This probably reflects the fact that more and more respondents were entering the labor force and were meeting the criteria set out in the previous chapter. The decline in the last four years of observations may well have been a function of the increase in the number of respondents not interviewed in those years. The number of noninterviewees apparently was larger in the later panels. There is no obviously discernable trend in the coefficient of determination.

1. Earnings Equations by Veteran's Status by Year

As was noted above, the returns to veteran status were statistically significant in every year for the sample as a whole and thus one would expect to see more significantly different returns between these two groups in any of the individual years. For most of the variables, this is true. As the aggregate sample showed, the returns to experience were much smaller for veterans than for nonveterans. However, in both groups, the returns declined gradually over the period of the survey. In 1966, the returns were $195 and $267 respectively, for veterans and nonveterans. By 1980, the returns were $95 and $219 respectively.

CIVTRA, the returns to successful completion of a civilian vocational training course, were much lower for veterans than for nonveterans throughout the period. The difference was quite large in the early years ($381 for

Table XII

General Equation for Veterans: 1966-1970

Variable	Regression Coefficients 1966	1967	1968	1969	1970
XBT	-0.472	-0.297	-0.309	-0.593	-0.658
	(0.0086)	(0.0594)			
RACE	-0.184	-0.116	-0.011	-0.184	-0.112
	(0.0318)	(0.0267)	(0.8663)	(0.0025)	(0.1118)
VET	NA	NA	NA	NA	NA
CIVTRA	-0.010		-0.010	-0.071	-0.071
-0.059					
	(0.3200)	(0.8566)	(0.0983)	(0.0645)	(0.1465)
HYGRADE	0.000	0.018	0.017	0.033	0.040
	(0.9784)	(0.2451)	(0.2424)	(0.0151)	(0.0072)
DUNCAN	0.005	0.003	0.003	0.005	0.003
	(0.0068)	(0.0197)	(0.0523)	(0.0011)	(0.0053)
CHGDUN	-0.001	0.000	-0.000	0.000	0.001
	(0.4279)	(0.8147)	(0.5440)	(0.8435)	(0.2165)
CITY	-0.140	-0.128	-0.110	-0.155	-0.083
	(0.0062)	(0.0043)	(0.0123)	(0.0002)	(0.1830)
REGION	-0.135	-0.148	-0.063	-0.104	-0.046
	(0.0058)	(0.0004)	(0.1439)	(0.0092)	(0.3982)
MARSTA	-0.149	-0.128	-0.161	-0.066	-0.140
	(0.0010)	(0.0107)	(0.0002)	(0.1156)	(0.0031)
UNION	0.115	0.119	0.149	0.164	0.259
	(0.0247)	(0.0049)	(0.0006)		
SES	0.002	0.001	0.002	0.002	-0.003
	(0.1937)	(0.4693)	(0.2288)	(0.2657)	(0.0614)
ROTTER	0.002	-0.006	-0.003	-0.008	-0.010
	(0.7020)	(0.1525)	(0.4354)	(0.0602)	(0.0565)
NRDEP	0.018	0.055	0.015	0.052	0.020
	(0.4845)	(0.0037)	(0.4641)	(0.0033)	(0.3440)
RSQUARE	0.215	0.271	0.180	0.330	0.306
N	286	297	309	370	393
D-W (1)	2.014	2.154	1.779	1.965	1.858

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.
(2) Durbin-Watson statistic for each equation.

Table XIII

General Equation for Veterans: 1971-1980

Variable	Regression Coefficients 1971	1973	1975	1976	1978	1980
XBT	-0.567	-0.535	-0.618	-0.519	-0.380	-0.378
						(0.0010)
RACE	-0.167	-0.131	-0.185	-0.154	-0.108	-0.195
	(0.0056)	(0.0009)			(0.0075)	
VET	NA	NA	NA	NA	NA	NA
CIVTRA	-0.088	-0.073	-0.030	-0.066	-0.071	-0.035
	(0.0089)	(0.0065)	(0.2531)	(0.0177)	(0.0137)	(0.2659)
HYGRADE	0.033	0.053	0.052	0.050	0.042	0.044
	(0.0050)					
DUNCAN	0.006	0.004	0.003	0.004	0.006	0.006
			(0.0031)	(0.0002)		
CHGDUN	0.000	0.001	0.000	-0.000	-0.002	-0.000
	(0.6841)	(0.9197)	(0.9015)	(0.7979)	(0.0013)	(0.3342)
CITY	-0.082	-0.004	-0.121	-0.100	-0.161	-0.116
	(0.0321)	(0.8792)		(0.0016)		(0.0002)
REGION	-0.058	-0.098	-0.055	-0.093	-0.080	-0.014
	(0.1079)	(0.0007)	(0.0506)	(0.0014)	(0.0046)	(0.6354)
MARSTA	-0.057	-0.166	-0.072	-0.054	-0.151	-0.095
	(0.1501)			(0.1365)		(0.0061)
UNION	0.218	0.181	0.155	0.162	0.197	0.154
SES	0.000	0.001	0.002	0.002	0.0000	0.001
	(0.9623)	(0.1191)	(0.0241)	(0.0274)	(0.7851)	(0.5399)
ROTTER	-0.009	-0.008	-0.007	0.004	-0.002	0.002
	(0.0485)	(0.0201)	(0.0279)	(0.3107)	(0.4218)	(0.6217)
NRDEP	0.046	0.031	0.025	0.041	0.051	0.038
	(0.0051)	(0.0196)	(0.0517)	(0.0005)		(0.0014)
RSQUARE	0.380	0.387	0.325	0.318	0.324	0.305
N	483	771	791	759	828	755
D-W (1)	2.034	1.964	1.989	1.954	1.989	1.990

(1) value in parentheses beneath some coefficients is the proability that the associated t value is equal to zero when that probability is greater than zero.
(2) Durbin-Watson statistic for each equation.

Table XIV

General Equation for Nonveterans: 1966-1971

Variable	Regression Coefficients 1966	1967	1968	1969	1970	1971
XBT	-0.795	-0.821	-0.998	-0.846	-0.909	-0.947
RACE	-0.249	-0.153	-0.160	-0.150	-0.141	-0.128
VET	NA	NA	NA	NA	NA	NA
CIVTRA	-0.075	-0.099	-0.059	-0.091	-0.073	-0.105
	(0.1534)	(0.0139)	(0.0372)	(0.0002)	(0.0017)	
HYGRADE	0.051	0.049	0.062	0.035	0.048	0.048
DUNCAN	0.002	0.002	0.003	0.005	0.004	0.005
	(0.0255)	(0.0492)				
CHGDUN	0.000	0.002	-0.000	0.000	0.001	0.000
	(0.9987)	(0.0078)	(0.6265)	(0.7683)	(0.2304)	(0.5450)
CITY	-0.130	-0.100	-0.155	-0.144	-0.162	-0.116
REGION	-0.150	0.186	-0.140	-0.130	-0.120	-0.121
MARSTA	-0.204	-0.140	-0.162	-0.179	-0.166	-0.145
UNION	0.114	0.141	0.151	0.187	0.203	0.196
SES	0.001	0.002	0.001	0.001	0.001	0.001
	(0.2452)	(0.0292)	(0.1834)	(0.3793)	(0.1188)	(0.1570)
ROTTER	-0.005	-0.0`9	-0.006	-0.002	-0.002	0.000
	(0.0851)	(0.0008)	(0.0137)	(.3033)	(0.5347)	(0.6276)
NRDEP	0.013	0.032	0.014	0.002	0.011	0.011
	(0.3695)	(0.0085)	(0.2362)	(0.8285)	(0.2837)	(0.2159)
RSQUARE	0.402	0.416	0.442	0.443	0.436	0.475
N	774	916	1107	1277	1432	1608
D-W (1)	1.769	1.889	1.827	1.814	1.913	1.860

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.
(2) Surbin-Watson statistic for each equation.
(3) Every respondent in this sample was married.

Table XV

General Equation for Nonveterans: 1973-1980

Variable	Regression Coefficients 1973	1975	1976	1978	1980
XBT	-0.787	-0.746	-0.792	-0.849	-1.017
RACE	-0.148	-0.182	-0.150	-0.182	-0.180
VET	NA	NA	NA	NA	NA
CIVTRA	-0.054	-0.047	-0.048	-0.079	-0.081
	(0.0040)	(0.0156)	(0.0169)		(0.0003)
HYGRADE	0.052	0.055	0.058	0.054	0.047
DUNCAN	0.004	0.003	0.005	0.003	0.005
CHGDUN	0.001	0.001	0.000	0.001	0.000
	(0.3783)	(0.2564)	(0.3897)	(0.01740)	(0.9099)
CITY	-0.132	-0.133	-0.133	-0.151	-0.162
REGION	-0.083	-0.068	-0.066	-0.033	-0.044
				(0.1409)	(0.0490)
MARSTA	-0.156	0.090	-0.131	-0.147	-0.128
UNION	0.169	0.143	0.155	0.156	0.133
SES	0.002	0.002	0.001	0.002	0.003
	(0.0008)	(0.0088)	(0.2200)	(0.0009)	
ROTTER	-0.002	-0.004	-0.006	-0.008	-0.002
	(0.1464)	(0.0703)	(0.0040)	(0.0002)	(0.3444)
NRDEP	0.019	0.043	0.020	0.016	0.021
	(0.0265)		(0.0112)	(0.0666)	(0.0084)
RSQUARE	0.439	0.405	0.443	0.407	0.430
N	1861	1608	1548	1620	1481
D-W (1)	1.822	1.929	1.936	1.943	1.934

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.

(2) Durbin-Watson statistic for each equation.

nonveterans and $51 for veterans). The pattern of a rise in returns to CIVTRA in the 1960's that was apparent in the combined group was again evident for both veterans and nonveterans. In both groups, the returns leveled off and declined somewhat in the 1970's as in the pooled data set. By 1978, the gap in returns between nonveterans and veterans had closed significantly ($508 for veterans and $637 for nonveterans). Yet, in 1980, the gap again widened ($216 for veterans and $554 for nonveterans). Yet, overall, the magnitude of the coefficient changed very little for nonveterans between 1966 and 1980 (0.072 and 0.078 respectively) when compared to veterans (0.010 and 0.034 respectively) and the group as a whole. This illustrates how much the data varies from year to year and the potential dangers of restricting analysis to a single year. This pattern becomes much more evident when the data set is partitioned more finely.

The coefficients of determination for the veterans equations are lower than that of the nonveterans in every year. This is similar to the results from the pooled data set. When the groups have been disaggregated by year and by veteran status, some of the variables are not as highly significant. For instance, only nine of thirteen variables are significant at the level of 0.05 for veterans in 1971 while there are also nine significant variables for nonveterans. However, for the nonveterans, the same variables are consistently not significant in each of the eleven panels.

The variables that are of major interest are almost always significant to at least 0.05. This contrasts with the pooled data set as a whole where thirteen of fourteen variables were significant at the level of 0.0001.

2. Earnings Equations by Race by Year

When the earnings equations for Blacks were estimated for a single year there were fewer variables that were significant to the level of 0.05 as compared to more aggregate groups. The change in duncan from father to son (CHGDUN) and the number of dependents (NRDEP) were consistently not significant at the 0.05 level. Of the other variables, only HYGRADE, which is the number of years of education of the respondent, was significant to the 0.05 level in every year. For Whites, this pattern was much less pronounced. Only CHGDUN and ROTTER were not significant. This phenomenon will be discussed in more detail in the next section.

The patterns that have been observed in previous sections for returns to completion of a civilian training course (CIVTRA) can be found in the equations for these groups, only to a more pronounced degree. In neither group was CIVTRA significant to the 0.05 level in 1966. For Whites, the coefficient was consistently significant to at least the 0.01 level after 1968. During the same time period, the coefficient also became larger. For Blacks, the pattern was less consistent. In the 1960's the returns to

Table XVI

General Equation by Year for Whites: 1966-1971

	Regression Coefficients					
Variable	1966	1967	1968	1969	1970	1971
XBT	-0.782	-0.863	-0.932	-0.856	-0.974	-0.939
RACE	NA	NA	NA	NA	NA	NA
VET	0.110	0.139	0.101	0.101	0.114	0.094
	(0.0002)	(0.0001)				
CIVTRA	-0.050	-0.010	-0.068	-0.087	-0.054	-0.099
	(0.2993)	(0.5645)	(0.0134)		(0.0159)	
HYGRADE	0.041	0.052	0.055	0.033	0.049	0.046
DUNCAN	0.004	0.002	0.003	0.006	0.004	0.005
		(0.0091)	(0.0002)			
CHGDUN	-0.001	0.001	-0.000	0.000	0.001	0.000
	(0.2980)	(0.0734)	(0.3777)	(0.7334)	(0.0988)	(0.9425)
CITY	-0.129	-0.124	-0.157	-0.150	-0.146	-0.100
REGION	-0.137	-0.150	-0.094	0.102	-0.078	-0.090
					(0.0014)	
MARSTA	-0.227	-0.135	-0.207	-0.172	-0.182	-0.139
UNION	0.102	0.146	0.156	0.192	0.207	0.207
	(0.0006)					
SES	0.001	0.001	0.001	0.001	0.002	0.001
	(0.4572)	(0.0841)	(0.1775)	(0.3246)	(0.0175)	(0.3345)
ROTTER	-0.005	-0.008	-0.007	-0.003	-0.002	0.001
	(0.0907)	(0.0015)	(0.0018)	(0.1472)	(0.4257)	(0.5804)
NRDEP	0.028	0.060	0.019	0.026	0.019	0.031
	(0.0780)		(0.1240)	(0.0174)	(0.0962)	(0.0014)
RSQUARE	0.257	0.341	0.345	0.413	0.388	0.427
N	844	956	1097	1281	1426	1621
D-W (1)	1.890	1.946	1.863	1.819	1.946	1.924

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.

(2) Durbin-Watson statistic for each equation.

Table XVII

General Equation for Whites: 1973-1980

	Regression Coefficients				
Variable	1973	1975	1976	1978	1980
XBT	-0.750	-0.753	-0.755	-0.731	-0.840
RACE	NA	NA	NA	NA	NA
VET	0.083	0.079	0.077	0.056	0.060
				(0.0034)	(0.0020)
CIVTRA	-0.063	-0.046	-0.050	-0.066	-0.060
		(0.0079)	(0.0053)	(0.0008)	(0.0043)
HYGRADE	0.051	0.058	0.052	0.051	0.044
DUNCAN	0.004	0.003	0.005	0.004	0.005
CHGDUN	0.000	0.000	-0.000	-0.000	-0.000
	(0.6951)	(0.6419)	(0.3315)	(0.4374)	(0.8004)
CITY	-0.082	-0.122	-0.106	-0.145	-0.150
REGION	-0.056	-0.050	-0.052	-0.040	-0.026
	(0.0033)	(0.0072)		(0.0415)	(0.1952)
MARSTA	-0.139	0.111	-0.121	-0.141	-0.101
UNION	0.172	0.137	0.163	0.153	0.105
SES	0.002	0.002	0.002	0.002	0.003
	(0.0157)	(0.0169)	(0.0073)	(0.0128)	(0.0002)
ROTTER	-0.002	-0.005	-0.003	-0.004	-0.000
	(0.2198)	(0.0141)	(0.0985)	(0.0282)	(0.9076)
NRDEP	0.041	0.035	0.039	0.026	0.032
				(0.0033)	
RSQUARE	0.351	0.314	0.347	0.294	0.294
N	1995	1946	1831	1932	1778
D-W (1)	1.889	1.966	1.967	1.957	1.931

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than zero.

(2) Durbin-Watson statistic for each equation.

Table XVIII

General Equation for Blacks: 1966-1971

Variable	Regression Coefficients 1966	1967	1968	1969	1970	1971
XBT	-0.095	-0.025	-0.486	-0.400	-0.372	-0.521
	(0.6802)	(0.8887)	(0.0019)	(0.0044)	(0.0014)	
RACE	NA	NA	NA	NA	NA	NA
VET	0.044	0.101	0.190	0.055	0.097	0.041
	(0.5916)	(0.1371)	(0.0042)	(0.3838)	(0.1015)	(0.7591)
CIVTRA	0.055	-0.318	-0.026	-0.087	-0.106	-0.088
	(0.7079)		(0.6439)	(0.0907)	(0.0225)	(0.0224)
HYGRADE	0.031	0.006	0.059	0.035	0.037	0.043
	(0.0060)	(0.6637)		(0.0016)	(0.0002)	
DUNCAN	0.001	0.003	0.006	0.003	0.004	0.005
	(0.8029)	(0.1665)	(0.0039)	(0.0952)	(0.0284)	(0.0010)
CHGDUN	0.002	0.002	-0.001	-0.001	0.000	0.000
	(0.4293)	(0.2439)	(0.4297)	(0.5222)	(0.9898)	(0.3830)
CITY	-0.104	-0.066	-0.055	-0.125	-0.139	-0.159
	(0.0892)	(0.1880)	(0.2373)	(0.0102)	(0.0027)	
REGION	-0.223	-0.274	-0.243	-0.223	-0.186	-0.127
	(0.0002)					(0.015)
MARSTA	-0.079	-0.155	-0.057	-0.084	-0.103	-0.098
	(0.1102)	(0.0025)	(0.1412)	(0.0476)	(0.0134)	(0.0088)
UNION	0.111	0.100	0.148	0.142	0.221	0.179
SES	0.004	0.002	0.002	0.001	0.001	-0.000
	(0.0163)	(0.0517)	(0.1683)	(0.4956)	(0.5873)	(0.7379)
ROTTER	0.001	-0.003	0.006	-0.001	0.000	-0.003
	(0.9208)	(0.5455)	(0.1891)	-(0.8060)	(0.9896)	(0.5011)
NRDEP	0.001	0.001	0.026	-0.005	0.012	0.001
	(0.9496)	(0.9627)	(0.1419)	(0.7707)	(0.4105)	(0.9201)
RSQUARE	0.369	0.439	0.458	0.330	0.403	0.431
N	216	257	319	365	399	470
D-W (1)	1.661	1.945	1.788	1.961	1.784	1.731

(1) value in parenthese beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than 0.0001.
(2) Durbin-Watson statistic for each equation.

Table XIX

General Equation for Blacks: 1973-1980

Regression Coefficients

Variable	1973	1975	1976	1978	1980
XBT	-0.391	-0.298	-0.179	-0.178	-0.240
		(0.0172)	(0.1889)	(0.2200)	(0.1812)
RACE	NA	NA	NA	NA	NA
VET	0.014	0.024	0.016	0.049	0.037
	(0.7004)	(0.5631)	(0.7105)	(0.2126)	(0.3604)
CIVTRA	-0.043	-0.017	-0.053	-0.116	-0.103
	(0.1469)	(0.6281)	(0.1956)	(0.0002)	-(0.0085)
HYGRADE	0.042	0.030	0.053	0.028	0.034
		(0.0025)		(0.0043)	
DUNCAN	0.004	0.006	0.003	0.004	0.005
	(0.0020)		(0.0692)	(0.0104)	(0.0002)
CHGDUN	0.000	0.000	0.002	0.000	-0.001
	(0.7448)	(0.7781)	(0.2675)	(0.5656)	(0.2513)
CITY	-0.107	-0.148	-0.158	-0.187	-0.134
	(0.0021)	(0.0004)			(0.0014)
REGION	-0.201	-0.109	-0.186	-0.086	-0.081
		(0.0015)		(0.0178)	(0.0532)
MARSTA	-0.215	-0.012	-0.093	-0.178	-0.159
		(0.7488)	(0.0132)		
UNION	0.139	0.193	0.132	0.223	0.205
	(0.0002)				
SES	0.003	0.003	0.000	0.001	0.001
	(0.0016)	(0.0045)	(0.9115)	(0.5005)	(0.2175)
ROTTER	-0.005	-0.002	-0.003	-0.010	-0.004
	(0.1536)	(0.6414)	(0.4097)	(0.0005)	(0.3645)
NRDEP	-0.004	0.019	-0.006	0.009	0.022
	(0.6924)	(0.1467)	(0.6070)	(0.4646)	(0.0596)
RSQUARE	0.439	0.375	0.399	0.402	0.406
N	610	482	472	513	458
D-W (1)	1.968	1.879	1.885	1.989	1.816

(1) value in parentheses beneath some coefficients is the probability that the associated t value is equal to zero when that probability is greater than 0.0001.
(2) Durbin-Watson statistic for each equation.

CIVTRA increased, although they were less than those for Whites in the same year. They then decline in the early 1970's. However, the resurgence in the level of returns was much more pronounced for Blacks in 1978 and 1980 than it was for Whites in 1980, the return to CIVTRA was $747 for Blacks, which was larger than for Whites at $433.

The magnitude of the coefficient for REGION declined throughout the time period for both groups. For Blacks, REGION was a far more important variable in the earlier years than was CITY. By 1980, the returns to REGION had declined to a lower level than those for CITY. For Whites, the returns were about the same in 1966. By 1980, the coefficient for CITY, which had changed little, was much larger than that of REGION.

The coefficients of determination in each year for both racial groups were about the same. However, from year to year, within a group, the coefficient of determination varied quite a bit. The range of variation for Whites was from 0.257 to 0.427. For Blacks, it was from 0.330 to 0.458. These results tend to indicate that the log-linear format was as effective for estimating earnings equations for Blacks as for Whites.

C. EARNINGS EQUATIONS BY RACE AND VETERAN STATUS BY YEAR

The degree to which an equation for a given group had more variables that were statistically significant than in

another year was very much a function of sample size (N) for that group. For instance, White nonveterans represented the largest of the four groups to be looked at in this section (for 1980 N=1,143). Seven variables were consistently significant to the 0.05 level: XBT, CIVTRA (in the later years), HYGRADE, DUNCAN, CITY, REGION and UNION. The trends that were apparent in the larger groups were apparent in this group. For instance, CIVTRA was not an important variable in the earlier years, yet it had quite a large coefficient in the later years as more individuals acquired vocational training. REGION had a pattern very similar to the more aggregate groups. It was highly significant in the early years with a correspondingly large coefficient. For the last two years of observations, it was not significant to the 0.05 level.

In contrast, Black veterans were a very small group, never more than 138 (in 1978). In fact for 1967 and 1969, no variable could meet the criteria described above. Nor was any variable able consistently to meet the criteria in all years. Appendix C contains estimates of earnings equations generated by a stepwise procedure in SAS. The variables are listed for each year in the order in which they entered the equation. The stepwise procedure in SAS uses contribution to the coefficient of determination as the criterion for determining the order of entry. The estimates of equations for White veterans and White nonveterans are

discussed in the following section while the findings for Black veterans and Black nonveterans are dealt with in the last section of this chapter. However, the findings discussed are not strictly comparable to the findings discussed in the previous sections of this chapter.

1. White Veterans and White Nonveterans

White veterans, who constituted a much smaller group than White nonveterans did in any given year, had patterns to the estimates of earnings equations that were considerably different from the estimates patterns to the latter group. There is a second factor which could have affected the estimates which has been mentioned previously: there may be other variables not included in the general equation which may tend to explain the experiences of veterans. There are a number of contrasts between the two groups that are of interest. Experience tended to have much smaller returns for White veterans than for White nonveterans. This was very similar to the patterns established by the comparison of veterans and nonveterans in earlier sections of this chapter. As in the more aggregate data, CIVTRA was a much less important variable for White veterans than for White nonveterans.

The clear pattern of declining importance for the variable REGION for White nonveterans was not apparent for White veterans. UNION, important for White nonveterans, was

not for White veterans. The last major difference was that of the much higher coefficient of determination for White nonveterans. DUNCAN (relative ranking of job status) was a most important variable for both White veterans and White nonveterans. Indeed, in the later years of the survey, it contributed the most to the coefficient of determination in a consistent manner. For White nonveterans, the coefficient of determination ranged from 0.276 in 1966 to 0.449 in 1971. For White veterans, the coefficient of determination was usually somewhat smaller, as would be expected from previous discussion, ranging from 0.124 to 0.342.

2. Black Veterans and Black Nonveterans

The most important variable for both Black veterans and nonveterans was REGION. The earnings premium associated with REGION for Whites was consistently much smaller than it was for Blacks. This meant that a Black living in the South could expect, on average, all other things being equal, to have a much smaller income as a result of living in the South than would a White. For Black nonveterans, REGION was the only variable that is significant to the level of 0.05 in every year. For Black veterans, it was significant in more years than any other variable. At the average income for the group, the returns to an additional year of experience declined for Black nonveterans over the period of the survey despite the increase in the size of the coefficient of XBT over time. This, again, was due to the increase in

the average number of years of experience for the group over time. Its effect upon income was also consistently smaller for Blacks than for Whites, regardless of veteran status. HYGRADE (the number of years of formal education) was the most important variable for Black nonveterans after 1971 in terms of contribution to the coefficient of determination.

The rest of the variables were not significant in the majority of years. The coefficients they exhibit were similar to what has been seen elsewhere. The equations for Black nonveterans had the consistently best coefficients of determination over the years of any group, ranging from 0.328 to 0.450, usually very near 0.390. The sample size for Black veterans in relation to Black nonveterans was slightly smaller than for White veterans in relation to White nonveterans. This is not surprising since Blacks only accounted for about ten percent of the veterans as compared to making up about 21% of the population as a whole in the sample.

The earnings of Black veterans showed extremely variable returns to all the variables with few discernable patterns. For Black veterans, CHGDUN (the change in job status from father to son) was significant in a number of panels in the 1970's. This was the only group where this occurred. This indicates that Black veterans, as a group, might have been somewhat more upwardly mobile than the other three groups. UNION (whether or note the respondent belonged

to a collective bargaining association) was the most consistently significant variable. Nevertheless, in many years, the coefficient of determination was actually larger for this group than for others, often with only two or three significant variables. 1968 and 1970 stand out in this respect (R=0.531 and R=0.540 respectively). The equations for Black veterans also showed some of the worst fits.

V. VARIABLE DEFINITION AND DEVELOPMENT OF FULL EMPLOYMENT CRITERIA

A. SPECIFICATION OF VETERAN STATUS

In this section, several aspects of veteran status will be discussed. First, the effect of applying different minimum length of service criteria to define veteran status will be examined. Second, the apparent interaction of the years of experience in the workforce and veteran status will be discussed. A "single term of enlistment" definition of veteran status will be presented, using the concept of minimum and maximum lengths of service that vary by branch of service. The last section shall briefly address the issue of selection bias. This is an important issue because any positive returns to veteran status must be tempered by the knowledge that veterans have been selected from the larger population. If one were to compare veterans and nonveterans of similar ability and the returns were essentially the same as those for the larger group, then selection bias would probably not be a problem.

1. Defining Veteran Status by Minimum Length of Service

Table XX presents the regression coefficients for the variable VET (veteran status), as different minimum length of service (LOS) criteria are applied, for both 1978 and 1980. The minimum LOS's range from 0 to 24 months. Those

Table XX

Change in Coefficient for Veteran Status

as Criteria for Minimum LOS Increases

Main LOS (in Months)	1978 Coeff	1978 Std Dev	1980 Coeff	1980 Std Dev
0	0.060	0.017	0.060	0.017
	(0.0004)		(0.0006)	
3	0.061	0.017	0.061	0.018
	(0.0004)		(0.0006)	
6	0.058	0.018	0.064	0.018
	(0.0010)		(0.0004)	
9	0.062	0.019	0.068	0.019
	(0.0008)		(0.0003)	
12	0.063	0.019	0.069	0.019
	(0.0009)		(0.00043)	
18	0.067	0.019	0.072	0.020
	(0.0005)		(0.0003)	
24	0.069	0.021	0.073	0.021
	(0.0010)		(0.0006)	

veterans who have less than the minimum length of service are excluded from the data set so that the veterans are compared to legitimate nonveterans only. As can be seen, there seems to be a slight increase in the magnitude of the coefficient as the minimum length of service increases. However, this increase is much smaller than even one standard deviation. Each coefficient is positive and significant to at least the 0.01 level. There does not seem to be any difference between veterans who completed their term of enlistment, which was nominally twenty four months for Army veterans (DMDC, Appendix E), and those who served considerably less. A confounding factor that may be affecting these results is that the lower minimum LOS's allow reservists to be counted as veterans, along with those individuals who otherwise failed to complete successfully a minimum enlistment. Thus, a minimum length of service criterion should probably be applied anyway.

2. Interaction of Experience in Work Force and Veteran Status

There is an interesting interaction between years of experience in the work force and veteran status. Table XXI presents the estimates of the general equation for 1980 both when the experience variable includes time spent in the armed services (AFMOS) and when it excludes time spent in the armed services. There are some surprising changes in the magnitude and significance of the regression coefficients

Table XXI

General Equation for 1980 with Different Experience Variable

Variable	Including AFMOS[1]	Excluding AFMOS[2]
XBT	-0.897	-0.730
VET[3]	-0.006	0.060
	(0.7372)	(0.0006)
RACE	-0.185	-0.183
CIVTRA	-0.068	-0.072
HYGRADE	0.048	0.044
DUNCAN	0.005	0.005
NRDEP	0.026	0.028
CHGDUN	-0.000	-0.000
	(0.4432)	(0.0810)
CITY	-0.148	-0.148
REGION	-0.034	-0.033
	(0.0520)	(0.0609)
MARSTA	-0.116	
UNION	0.130	0.131
SES	0.002	0.002
	(0.0002)	(0.0002)
ROTTER	-0.001	-0.001
	(0.5278)	(0.4904)
RSQUARE	0.393	0.390
N	2236	2236
DW	2.000	1.990

1. EXPER = AGE less HYGRADE plus six years.

2. EXPER = AGE less HYGRADE plus six years plus any military service. This is the same equation as presented in Chapter IV.

3. VET = Respondent is classified as a veteran if he served a minimum of one month on active duty.

for the variables VET and XBT. When AFMOS is included in the experience variable, the regression coefficients for (with a minimum of one month LOS) is not significant. At the same time, the coefficient of XBT is somewhat larger (-0.897) than when AFMOS is excluded from the experience variable (-0.730). The rest of the equation is essentially unchanged. When military experience is accounted for in the same manner as experience in the civilian labor force, there is no unique premium accuring to time spent in the armed forces (veteran status) as compared to equivalent time spent in the civilian labor force. The experience variable that does not distinguigh between the types of experience masks the effect of being a veteran and apparently causes the equation to under-estimate this effect.

Table XXII compares the adjusted coefficients for XBT for the two definitions. For the experience variable that includes AFMOS, the coefficient is from the equation estimating the returns for the entire sample. For the experience variable that does not include AFMOS, the coefficient is from the equation estimating the returns for veterans only. This equation is from Table XIII in chapter IV. This was done so as to count only the returns to experience that veterans were accruing. The adjusted coefficient for veteran status is also presented in Table XXII. These coefficients are drawn from Table XXI. The premiums for these variables is also included in Table XXII. As can be

Table XXII

Adjusted Coefficients and Premiums

for XBT and VET from Table XXI

Variable	Including AFMOS	Excluding AFMOS
XBT[1]	0.028[4]	0.012[5]
VET[2]	-0.006	0.062
Premium for XBT[3]	$206	$85
Premium for VET[3]	0	$464

1. effect = B*(XBT*-0.1) for average number of years of experience (11.69 years)
2. g=exp(c)-1
3. $ effect=income-exp(in(income)+(B*(value))) for average income ($7,256.33). For experience, this is the premium accruing to an additional year of experience. For veteran status, it is the premium accruing to the entire time spent in the military.
4. XBT is for entire group of veterans and nonveterans alike. Coefficient Fund in Table XXI.
5. XBT is for veterans only. Coefficient (-0.378) found in Table XI of Chapter IV. The comparison of returns to experience for veterans plus premium accruing to veteran status to the returns to experience for the whole group is the best comparison to make.

seen, the premium for an additional year of experience for the entire group when experience includes AFMOS is $206. The premium for an additional year of experience is much less for veterans, on average ($85). However, the premium for being a veteran is much larger for the equation where experience does not include AFMOS ($464).

Thus, there does seem to be a quality to time spent in the armed forces that is not present for equivalent time spent in the civilian work force. This tends to confirm De Tray's (1982) findings that veteran status is a valuable screening device.

3. A Single Term of Enlistment Definition of Veteran Status

Defining a variable for a single enlistment for enlisted personnel may help to distill the effects of being a veteran somewhat more finely than the estimates previously discussed. This is based upon the hypothesis that veterans who successfully complete a single term of enlisted service may have significantly different degrees of success in the civilian work force as measured by yearly income than do veterans who (1) complete less than a full term of service for whatever reason; whether that person who is a reservist or failed to complete a term of regular enlisted service for some other reason; or (2) complete more than a single term of enlisted service. To support this thesis, the returns to veteran status for all three groups will be compared.

There are some thirty-six officers in the ranks of the veterans who were eliminated in this definition. Additionally, in determining a minimum length of service cutoff, the branch of service must be taken into account. Appendix E contains the distribution of enlistments by length of enlistment and branch of service. The minimum tour for an Army draftee was 24 months. The maximum enlistment the Army had during the Vietnam era was forty-eight months. For the Navy and the Air Force, the minimum and maximum were 36 and 72 months respectively. The Marines had enlistment lengths similar to the Army.

Table XXIII presents the estimates for 1978 and 1980 using the single enlistment definition of veteran status. Veterans who do not meet the single term enlistment criteria are eliminated from the data set. In both years, the coefficient was positive (0.062 in 1978 and 0.064 in 1980) and significant to the 0.0050 level in both years.

As Table XXV shows, the returns for veterans, who served less than one full term as defined above, were not significant in 1980 (0.039, prob $|t|=0$ is 0.1289). It was somewhat larger in 1978 (0.054) and significant to the level of 0.05. However, it was still smaller than the coefficient for a single term of enlistment. Quite the opposite was true for veterans who served more than one term. Table XXVI shows that in both 1978 and 1980, the coefficient for veteran status was significantly larger (more than two

Table XXIII

General Equation with BRSVC Specific

Veteran's Variable for 1978 and 1980

Variable	1978	1980
XBT	-0.708	-0.819
RACE	-0.156	-0.190
VET	0.062 (0.0033)	0.064 (0.0033)
CIVTRA	-0.074	-0.068 (0.0005)
HYGRADE	0.049	0.045
DUNCAN	0.004	0.005
CHGDUN	-0.000 (0.7971)	-0.000 (0.9260)
CITY	-0.154	-0.155
REGION	-0.049 (0.0092)	-0.044 (0.0246)
MARSTA	-0.156	-0.114
UNION	0.161	0.116
SES	0.002 (0.0006)	0.002
ROTTER	-0.007 (0.0003)	-0.001 (0.5360)
NRDEP	0.020	0.030
RSQUARE	0.388	.398
N	2064	1897
DW	1.961	1.991
N OF VETERANS	455	425

Table XXIV

Distribution of Length of Service

LOS/Year	1978	1980
0 (nonveterans)	1617	1481
0-1	6	7
2-3	28	25
4-6	92	89
7-9	17	12
10-12	32	30
13-18	40	39
19-24	236	201
25-36	131	127
37-48	181	166
49-72	46	41
73 & up	19	18

Table XXV

General Equation Comparing Veterans with Less Than One Term of Service To Nonveterans

Variable	1978	1980
XBT	-0.763	-0.907
RACE	-0.176	-0.179
VET	0.054 (0.0279)	0.039 (0.1289)
CIVTRA	-0.074	-0.076 (0.0002)
HYGRADE	0.052	0.046
DUNCAN	0.004	0.005
CHGDUN	0.000 (0.5772)	-0.000 (0.7173)
CITY	-0.148	-0.162
REGION	-0.038 (0.0619)	-0.037 (0.0687)
MARSTA	-0.144	-0.133
UNION	0.163	0.125
SES	0.002 (0.0049)	0.002 (0.0004)
ROTTER	-0.007 (0.0003)	-0.001 (0.6543)
NRDEP	0.022 (0.0048)	0.021 (0.0043)
RSQUARE	0.394	0.4156
N	1901	1727
DW	1.974	1.989
N OF VETERANS	292	255

Table XXVI

General Equation Comparing Multi-Term Veterans to Nonveterans

Variable	1978	1980
XBT	-0.823	-0.990
RACE	-0.174	-0.179
VET	0.186 (0.0053)	0.198 (0.0044)
CIVTRA	-0.081	-0.082 (0.0002)
HYGRADE	0.053	0.047
DUNCAN	0.004	0.005
CHGDUN	0.001 (0.3313)	-0.000 (0.9032)
CITY	-0.150	-0.160
REGION	-0.036 (0.1082)	-0.040 (0.0739)
MARSTA	-0.149	-0.122
UNION	0.163	0.115
SES	0.002 (0.0051)	0.003
ROTTER	-0.008 (0.0002)	-0.002 (0.3865)
NRDEP	0.015 (0.0816)	0.022 (0.0070)
RSQUARE	0.403	0.429
N	1647	1504
DW	1.963	1.986
N OF VETERANS	38	32

standard deviations) for multi-term veterans than it was for single term veterans (0.186 and 0.198 for 1978 and 1980 respectively). In both years, the coefficients were significant to the 0.01 level. This would seem to indicate that veteran status does act in a similar manner to experience in the work force. Apparently, other things equal, individuals who spend more time in the military seem to have higher returns to their time spent than individuals who spend less time. This acts in a similar manner to returns to total time spent in the civilian work force. Hitherto, returns to XBT have been calculated for an additional year, not for the entire time spent in the work force. But, based upon the magnitude of the premiums accruing to veteran status being much larger than the premium accruing to time spent in the civilian work force, the hypotheses of veteran status being a type of screening device is still valid.

4. Selection Bias in White Veterans Versus White Nonveterans

Two approaches were taken to this problem. The first was to take all white veterans and white nonveterans within two standard deviations of the mean IQ of the total group and estimate the general equation for this group. The second was to take the same individuals within two standard deviations of the mean IQ of all veterans and estimate the equation. That way, if veteran status were suddenly not significant, that would be indicative of selection bias. As

Table XXVII shows, in 1980, there was no apparent selection bias for whites since the returns to veteran status are not appreciably different from the returns which were discussed earlier for the entire group. Whites only were used because of the number of missing values for IQ for blacks.

B. DEVELOPMENT OF FULL-EMPLOYMENT CRITERIA

As discussed in chapter III, several criteria were applied to the data set in order to obtain a set of observations fitting the definition of fully employed. The first of these criteria was a variable (ELIGIBLE) capturing those respondents who claimed to be full time workers who were (a) healthy, (b) not in school, (c) not in jail, (d) not in the armed forces, (e) and who were at least eighteen years of age. The second criterion was a cutoff of those individuals still in the data set who claimed to have worked less than thirty-eight weeks in the year previous to being interviewed. Thirty eight weeks was picked to cover those cases where an individual might be considered to be fully employed, but only work a portion of the year. In Table XXVIII, which presents the distribution of the number of weeks worked by individuals who met the first criterion, there is a distinct increase in the proportion of individuals who worked a minimum of thirty-eight weeks.

The last two criteria were designed to eliminate spurious income observations. As Appendix D shows, the

Table XXVII

General Equation for Whites 1980 Within Two

Standard Deviations of Mean IQ

Variable	2 S.D. Group IQ Mean	2 S.D. Veteran IQ Mean
XBT	-0.853	-0.844
VET	-0.066 (0.0157)	0.063 (0.0210)
CIVTRA	-0.031 (0.2428)	-0.029 (0.2763)
HYGRADE	0.037	0.036
DUNCAN	0.004	0.004
CHGDUN	0.000	0.000 (0.8736)
CITY	-0.162	-0.158
REGION	-0.011 (0.6508)	-0.010 (0.6943)
MARSTA	-0.088 (0.0036)	-0.083 (0.0065)
UNION	0.054 (0.0382)	0.056 (0.0306)
SES	0.002 (0.0217)	0.002 (0.0176)
ROTTER	-0.002 (0.5219)	-0.002 (0.4311)
NRDEP	0.039	0.038 (0.0002)
RSQUARE	0.241	0.242
N	1124	1108
DW	1.945	1.950
N OF VETERANS	288	285
MEAN IQ	103.36	102.33
STD DEV	15.42	14.78

Table XXVIII

Distribution of Number of Weeks Worked in

Prior Twelve Months

	1978	1980
Missing	6	5
0 weeks	0	2
1-9	8	14
10-19	20	4
20-24	9	10
25-29	23	24
30-34	26	21
35-37	25	22
38-41	66	64
42-47	77	84
48-52	2674	2526
Total	2934	2776

range of income of the data set defined by the first two criteria has a minimum income observation of zero. When these were eliminated, the minimum income observation was $18.35. This was still not a realistic observation for an individual who claimed to be a full time member of the work force. Thus, the last criterion was applied: a minimum income of $1,500 was applied to the data set.

Table XXIX presents the estimates of the general equation developed in the previous chapter with the different criteria applied to the data set for 1980. Table XXIII, discussed in the previous section, presents the estimate of the equation when the income-of-less-than-$1,500 cutoff is applied. The variable for veteran status is defined as the single enlistment only variable discussed above. Appendix D contains the descriptive statistics supporting these equations. Appendix E contains the estimates of the general equation for 1978 as a comparison to the results described in Table XXIX.

The trends in the estimates for both the 1978 and 1980 equations are very similar. Thus, the discussion below is restricted to the 1980 panel. Two obvious findings stand out in Table X. The first is the decrease in the sample size as more stringent employment criteria are applied to the data set. The second is the marked increase in the coefficient of determination, especially after the income of less than $1,500 cutoff is applied (from 0.2735 for no income

Table XXIX

Comparison of Regression Results by Elibility Criteria: 1980

	Eligible Only	No Income Cutoff	Income > 0 Cutoff
XBT	-0.688	-0.666	-0.710
VET	-0.079 (0.0034)	0.081 (0.0012)	0.085 (0.0015)
RACE	-0.208	-0.184	-0.165
CIVTRA	-0.040 (0.0745)	-0.032 (0.1193)	-0.038 (0.0962)
HYGRADE	0.043	0.044	0.046
DUNCAN	0.006	0.005	0.006
NRDEP	0.032	0.027 (0.0003)	0.033
CHGDUN	0.000 (0.9077)	-0.000 (0.9076)	-0.000 (0.4440)
CITY	-0.147	-0.148	-0.177
REGION	-0.008 (0.7166)	-0.016 (0.4374)	-0.022 (0.3245)
MARSTA	-0.171	-0.124	-0.128
UNION	0.213	0.180	0.193
SES	0.001	0.001 (0.0350	0.001 (0.0519)
ROTTER	0.002	0.001 (0.7144)	0.000 (0.9537)
RSQUARE	0.2704	0.2735	0.3428
N	2776	2665	2389
DW	1.982	1.989	1.962

AD-A150 581 SPECIFICATION OF VETERAN STATUS IN ESTIMATING POST-SERVICE CIVILIAN EARNINGS(U) NAVAL POSTGRADUATE SCHOOL MONTEREY CA R J HIGIGNS JUN 84 2/2

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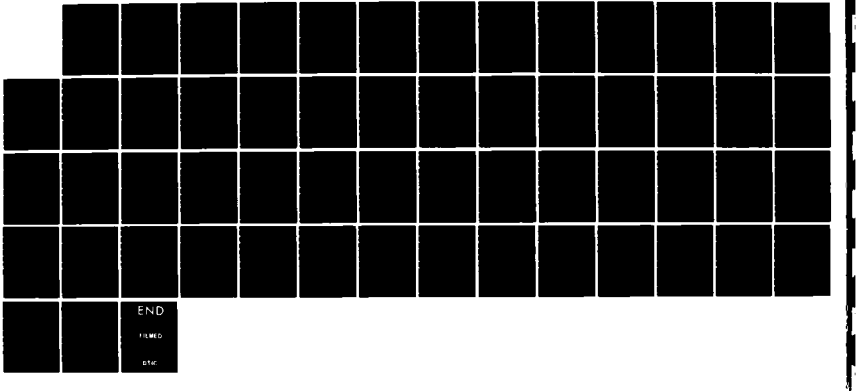

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

cutoff to 0.3028 for income of zero cutoff to 0.3900 for income less than $1,500 cutoff). The average income shows a concomitant rise as the income cutoffs are applied. For the ELIGIBLE only the average income is $6,240. When the income equals zero observations are eliminated from the data set, the average income rose to $7,131.

At the same time, there is an interesting shift in the magnitude of some of the coefficients of the variables as the different criteria are applied. In general, what might be termed as "controllable" human capital variables tend to increase in magnitude as the criteria are applied. For instance, the raw coefficient for XBT (the exponential of -0.1*years of experience) increases from -0.626 for no income cutoff to -0.726 for an income of less than $1,500 cutoff. The coefficient for CIVTRA (the successful completion of a civilian vocational training course) also increases as the criteria are applied, although the pattern is a little less pronounced. VETER (the brsvc specific definition of veteran status) actually declines, although it remains within one standard deviation of the ELIGIBLE only value. The magnitude of the coefficient of HYGRADE (number of years of formal education) does not vary significantly as the criteria are applied, thus running counter to the general pattern.

In contrast, the magnitude of the coefficients of "controllable" variables such as RACE tend to decline as

the criteria are applied. This trend is very pronounced when comparing the ELIGIBLE only estimate with the income of zero cutoff applied (-0.208 and -0.165 respectively). The coefficient of RACE increases again when the income cutoff of less than $1,500 is applied. This may be due to proportionally more Whites than Blacks tending to apparently give income observations between zero and $1,500. The coefficient of MARSTA (marital status) tended to steadily decrease as the income observations were applied (-0.171 for ELIGIBLE only to -0.118 when income less than $1,500 cutoff was applied).

In conclusion, as the more stringent employment criteria are applied, a more homogenous data set is created. Thus, the equations are explaining only income variation when all the criteria are applied rather than explaining both income variation and labor force participation as it does when applied to the data set with less stringent employment criteria applied.

VI. CONCLUSIONS AND RECOMMENDATIONS

There are a number of conclusions to be drawn from this paper. The first is that the equation estimating the returns to human capital factors for the pooled cross-sectional/time-series data set was highly significant. In fact, only one out of sixteen variables was not significant to at least the level of 0.01. The log-linear equation is a valid method of attempting to estimate returns to investments in human capital. The further analysis by year and by race and veteran status tended to confirm this. The second finding from this section was that the returns to veteran status were positive and significant in every year. However, blacks seemed to accrue smaller returns than did whites.

The second major conclusion to be drawn is that if veteran status is more closely defined by length of service as characterized by less than one term of enlistment, one term of enlistment, or more than one term of enlistment, there does seem to be a significant rise in returns to additional service. Furthermore, some of these rising returns can be explained away by the fact that military service is serving as a proxy for experience for those veterans who spend greater amounts of time in the military. However, this does not fully explain the rise in magnitude of the veteran status coefficient. There would seem to be a

fundamentally different nature to time spent in the armed forces as compared to an equivalent amount of time spent in the civilian labor force. One possible explanation would be the hypothesis that veteran status is acting as a screening device since the findings of chapter IV seem to indicate that the returns to veteran status are considerably larger than the returns to an equivalent amount of time spent in the civilian workforce. This would tend to confirm the findings of De Tray [Ref. 5].

The final conclusion to be drawn is that a stringent "fully employed" criteria allows the equation to estimate only variation in income rather than variation in labor force participation.

However, this investigation is still somewhat incomplete. There are two very specific areas in which work might be done with the 1981 panel of the NLS. The first recommendation is to analyze why the veterans who served less than one full term did so. There are two distinct possibilities. The first is that they are largely reservists who came on active duty only to fulfill training obligations. The second is that they enlisted or were drafted in to the armed forces and then subsequently failed to complete a normal term of enlistment for a variety of reasons. Analysis of this would help explain the apparent difference in returns to veteran status for veterans who served less than one term as compared to single term

enlistees. The information needed to conduct this analysis will be available on the 1981 panel of the NLS.

The second recommendation is to examine returns to military training by occupation. This information will also be available on the 1981 panel, which, unfortunately, was not available in time for use in this paper. However, based upon the findings of the Fifth Quadrennial Review of Military Compensation there should be significant differences in returns between occupational specialties. There is also more information available on how veterans acquired their schooling, whether it was prior to military service or subsequent to military service. There is also information on the types of benefits used by veterans in the sample.

There remains much work to be done in this field. log-linear equations of the type used in this paper capture at best less than 50% of the variation in income within a given group. Many times, this explanatory power is significantly lower. Effort must be given to perhaps finding different explanatory variables that would account for this variation.

APPENDIX A

SUMMARY STATISTICS

Table I

Summary Statistics for Entire Data Set 1966

Variables	N	N Missing	Mean	Min	Max
EXPER	1060	0	3.80	0	10
XBT	1060	0	.706	.368	1.0
IQ	702	358	98.262	54	1400
HYGRADE	1060	0	11.563	0	1800
SES	962	98	96.238	23	158.00
ROTTER	826	234	21.717	5.206	11.0
INCOME	1060	0	5109.19	1543.50	18521.98
CIVTRA	1060	0	.934	0	1
DUNCAN	1044	16	31.954	1.0	92.00
CITY	1060	0	.302	0	1
REGION	1060	0	.37588	0	1
MARSTA	1060	0	.377	0	1
UNION	1060	0	.252	1	2
NRDEP	752	308	.998	0	9
VET	1060	0	.270	0	1
RACE	1060	0	1.204	1	2

Table II

Summary Statistics for Whites 1966

Variable	N	N Missing	Mean	Min	Max
EXPER	844	0	3.49	0	10
XBT	844	0	.726	.368	1.000
IQ	619	234	100.309	64	140
HYGRADE	844	0	11.944	0	18
SES	880	66	100.54	23	158
ROTTER	666	223	21.087	11	39
INCOME	844	0	5487.60	1543.50	18521.99
CIVTRA	844	0	.923	0	1
DUNCAN	844	12	34.94	1	92
CITY	844	0	.312	0	1
REGION	844	0	.300	0	1
MARSTA	844	0	.359	0	1
UNION	844	655	.254	1	2
NRDEP	844	270	.902	0	9
VET	844	0	.313	0	1
RACE	844	0	--	1	2

Table III

Summary Statistics for Blacks 1966

Variable	N	N Missing	Mean	Min	Max
EXPER	216	0	4.99	0	10
XBT	216	0	.627	.368	1.00
IQ	83	142	84.62	54	119
HYGRADE	216	0	10.28	4	17
SES	182	37	80.86	26	126
ROTTER	160	71	24.37	12	36
INCOME	216	0	3630.61	1543.50	9260.99
CIVTRA	216	0	.975	0	1
DUNCAN	212	4	20.52	2	73
CITY	216	0	.347	0	1
REGION	216	0	.676	0	1
MARSTA	216	0	.499	0	1
UNION	216		.245	0	1
NRDEP	143	73	1.32	0	9
VET	216	0	.102	0	1
RACE	--	--	--	1	2

Table IV

Summary Statistics for Veterans 1966

Variable	N	N Missing	Mean	Min	Max
EXPER	286	0	2.63	0	83
XBT	286	0	.783	.3678	1
IQ	227	59	97.51	54	131
HYGRADE	286	0	11.75	6	17
SES	274	12	100.75	48	149
ROTTER	219	67	20.81	11	36
INCOME	286	0	5326.51	1543.50	14405.99
CIVTRA	286	0	.948	0	1
DUNCAN	281	5	33.40	1	87
CITY	286	0	.269	0	1
REGION	286	0	.294	0	1
MARSTA	286	0	.479	0	1
UNION	286	0	.248	1	2
NRDEP	189	97	.852	0	9
VET	--	--	--	0	1
RACE	286	0	1.076	1	2

Table V

Summary Statistics for Non Veterans 1966

Variable	N	N Missing	Mean	Min	Max
EXPER	785	0	4.20	0	10
XBT	785	0	.679	.368	1
IQ	482	303	98.73	55	140
HYGRADE	785	0	11.50	0	18
SES	698	87	94.67	23	158
ROTTER	609	176	22.07	11	39
INCOME	785	0	5008.66	1543.50	18521.99
CIVTRA	785	0	.931	0	1
DUNCAN	774	11	31.74	2	92
CITY	785	0	--	0	1
REGION	785	0	.406	0	1
MARSTA	785	0		0	1
UNION	224	561	.879	1	2
NRDEP	567	218	1.07	0	9
VET	--	--	--	0	1
RACE	785	0	1.251	1	2

Table VI

Summary Statistics for Entire Data Set 1980

Variable	N	N Missing	Mean	Min	Max
EXPER	2236	0	11.69	2.33	24
XBT	2236	0	.338	.091	.7919
IQ	1609	627	103.36	50	145
HYGRADE	2236	0	13.64	0	18
SES	2119	117	102.33	22	158
ROTTER	1729	507	22.29	11	42
INCOME	2236	0	7256.33	1541.40	18350
CIVTRA	2236	0	.300	0	1
DUNCAN	2224	15	46.31	2	96
CITY	2236	0	.286	0	1
REGION	2236	0	.409	0	1
MARSTA	2236	0	.226	0	1
UNION	2236	0	.278	1	2
NRDEP	2233	0	1.67	0	9
VET	2236	0	.338	0	1
RACE	2236	0	1.205	1	2

Table VII

Summary Statistics for White 1980

Variable	N	N Missing	Mean	Min	Max
EXPER	1778	0	11.38	3	24
XBT	1778	0	.347	.091	.7919
IQ	1400	378	105.65	50	145
HYGRADE	1778	0	13.98	0	18
SES	1709	69	107.14	22	158
ROTTER	1377	401	21.97	11	42
INCOME	1778	0	7769.86	1541.40	18350.00
CIVTRA	1778	0	.256	0	1
DUNCAN	1767	11	49.91	2	96
CITY	1778	0	.277	0	1
REGION	1778	0	.327	0	1
MARSTA	1778	0	.199	0	1
UNION	1778	0	.262	1	2
NRDEP	1778	0	1.583	0	9
VET	1778	0	.357	0	1
RACE	--	--	--	1	2

Table VIII

Summary Statistics for Black 1980

Variable	N	N Missing	Mean	Min	Max
EXPER	458	0	12.92	2.33	24
XBT	458	0	.304	.091	.792
IQ	209	249	88.04	50	127
HYGRADE	458	0	12.33	4	18
SES	410	48	82.29	26	155
ROTTER	352	106	23.53	12	35
INCOME	458	0	5262.74	1761.60	18350
CIVTRA	458	0	.459	0	1
DUNCAN	454	4	32.31	2	93
CITY	458	0	.319	0	1
REGION	458	0	.727	0	1
MARSTA	458	0	.332	0	1
UNION	458	0	.341	1	2
NRDEP	458	0	2.02	0	9
VET	458	0	.262	0	1
RACE	-	-	-	1	2

Table IX

Summary Statistics for Veterans 1980

Variable	N	N Missing	Mean	Min	Max
EXPER	755	0	10.37	2.33	22.83
XBT	755	0	.378	.102	.792
IQ	604	151	102.33	51	.38
HYGRADE	755	0	13.66	8	18
SES	722	33	103.02	36	153
ROTTER	454	301	21.77	11	42
INCOME	755	0	7332.18	1541.40	18350
CIVTRA	755	0	.234	0	1
DUNCAN	747	8	45.57	2	96
CITY	755	0	.246	0	1
REGION	755	0	.370	0	1
MARSTA	755	0	.223	0	1
UNION	755	0	.313	1	2
NRDEP	754	1	1.562	0	9
VET	-	-	-	0	1
RACE			1.159	1	2

Table X

Summary Statistics for Non Veterans 1980

Variable	N	N Missing	Mean	Min	Max
EXPER	1481	0	12.37	4	24
XBT	1481	0	.317	.0907	.6703
IQ	1005	476	103.99	50	145
HYGRADE	1481	0	13.64	0	18
SES	1397	84	101.98	22	158
ROTTER	1275	206	22.47	11	39
INCOME	1481	0	7217.66	1578.10	18350
CIVTRA	1481	0	.330	0	1
DUNCAN	1474	7	46.69	2	93
CITY	1481	0	.306	0	1
REGION	1481	0	.429	0	1
MARSTA	1481	0	.228	0	1
UNION	1481	0	.260	1	2
NRDEP	1481	0	1.727	0	9
VET	-	-	-	0	1
RACE	1481	0	1.228	1	2

APPENDIX B

ADJUSTED COEFFICIENTS FOR VARIABLES FROM EQUATIONS PRESENTED IN CHAPTER IV

1. Coefficients of Dichotomous Variables adjusted by Halvorsen-Palmquist formula g=exp(c)-1.

2. Effect of an additional year of experience at the mean number of years of experience (XBT).

Table I

Adjusted Coefficients for Pooled Time-Series Cross-Section Equations

	General	Vet	Nonvet	White	Black
XBT	0.0320	.0216	.0358	.0362	.0144
VET	.079	NA	NA	.080	.050
RACE	-.152	-.140	-.154	NA	NA
CIVTRA	-.067	-.058	-.069	-.049	-.083
CITY	-.123	-.101	-.130	-.118	-.124
REGION	-.086	-.074	-.091	-.068	-.153
MARSTA	-.109	-.095	-.112	-.115	-.087
UNION	.181	.186	.184	.174	.191

Table II

General Equation by Race and Veteran's Status

	Black Vet	Black Nonvet	White Vet	White Nonvet
XBT	.003	.0184	.0261	.0392
CIVTRA	-.088	-.081	-.154	-.058
CITY	-.130	-.124	-.098	-.087
REGION	-.109	-.166	-.067	-.068
MARSTA	-.121	-.078	-.089	-.124
UNION	.257	.179	.179	.171

Table III

General Equation by Year 1966-1980

Year	1966	1967	1968	1969	1970	1971	1973	1975	1976	1978	1980
Variable											
XBT[1]	.048	.045	.054	.049	.052	.051	.038	.046	.030	.023	.023
RACE[2]	-.217	-.139	-.140	-.144	-.131	-.128	-.134	-.166	-.138	-.141	-.167
VET[2]	.103	.137	.124	.104	.120	.097	.079	.077	.075	.060	.062
CIVTRA[2]	-.041	-.069	-.064	-.086	-.067	-.097	-.061	-.043	-.054	-.077	-.069
CITY[2]	-.126	-.105	-.138	-.138	-.138	-.107	-.092	-.122	-.113	-.143	-.138
REGION[2]	-.139	-.164	-.118	-.115	-.098	-.097	-.085	-.061	-.073	-.048	-.032
MARSTA[2]	-.178	-.132	-.155	-.143	-.148	-.118	-.148	-.082	-.104	-.140	-.111
UNION[2]	.119	.146	.174	.204	.241	.225	.184	.160	.174	.184	.140

[1] effect-B*(XBT)*-0.1

[2] g=exp(c)-1

Table IV

General Equation for Veterans 1966-1980

Year	1966	1967	1968	1969	1970	1971	1973	1975	1976	1978	1980
Variable											
XBT[1]	.036	.021	.021	.038	.042	.035	.032	.033	.026	.016	.013
RACE[2]	-.168	-.110	-.011	-.168	-.106	-.154	-.123	-.169	-.143	-.102	-.177
VET[2]	-	-	-	-	-	-	-	-	-	-	-
CIVTRA[2]	-.010	-.010	-.068	-.068	.057	-.084	-.070	-.030	-.064	-.068	-.034
CITY[2]	-.131	-.120	-.104	-.144	-.080	-.079	-.004	-.114	-.095	-.149	-.110
REGION[2]	-.126	-.138	-.061	-.099	-.045	-.056	-.094	-.053	-.089	-.077	-.014
MARSTA[2]	-.139	-.120	-.149	-.064	-.131	-.054	-.153	-.069	-.053	-.140	-.090
UNION[2]	.122	.126	.161	.178	.296	.244	.198	.168	.176	.218	.167

[1] effect=B*(XBT)*-0.1

[2] g=exp(c)-1

Table V

General Equation for Nonveterans 1966-1980

Year	1966	1967	1968	1969	1970	1971	1973	1975	1976	1978	1980
Variable											
XBT[1]	.052	.052	.061	.051	.054	.055	.047	.040	.033	.029	.030
RACE[2]	-.220	-.142	-.148	-.139	-.132	-.122	-.138	-.166	-.139	-.166	-.164
VET[2]	-	-	-	-	-	-	-	-	-	-	-
CIVTRA[2]	-.072	-.094	-.057	-.087	-.070	-.100	-.053	-.046	-.047	-.076	-.078
CITY[2]	-.122	-.095	-.144	-.134	-.150	-.110	-.124	-.125	-.125	-.139	-.150
REGION[2]	-.139	-.170	-.131	-.122	-.113	-.114	-.080	-.066	-.064	-.032	-.043
MARSTA[2]	-.185	-.131	-.150	-.150	-.153	-.135	-.144	-.086	-.123	-.137	-.120
UNION[2]	.121	.163	.163	.206	.225	.217	.184	.154	.168	.169	.142

[1] effect=B*(XBT)*-0.1

[2] g=exp(c)-1

Table VI

General Equation by Year for Whites 1966-1980

Year	1966	1967	1968	1969	1970	1971	1973	1975	1976	1978	1980
Variable											
XBT[1]	.055	.058	.060	.054	.060	.057	.042	.037	.034	.028	.027
RACE[2]	-	-	-	-	-	-	-	-	-	-	-
VET[2]	.116	.149	.106	.106	.121	.099	.087	.082	.080	.058	.062
CIVTRA[2]	-.049	-.010	-.066	-.083	-.053	-.094	-.061	-.045	-.049	-.064	-.058
CITY[2]	-.121	-.117	-.145	-.139	-.136	-.095	-.079	-.115	-.101	-.135	-.139
REGION[2]	-.128	-.139	-.089	-.097	-.075	-.086	-.054	-.048	-.049	-.039	-.026
MARSTA[2]	-.203	-.126	-.187	-.158	-.166	-.130	-.130	-.105	-.115	-.132	-.096
UNION[2]	.107	.157	.169	.212	.230	.230	.188	.147	.177	.165	.111

[1] effect=B*(XBT)*-0.1

[2] g=exp(c)-1

Table VII

General Equation for Blacks by Year 1966-1980

Year	1966	1967	1968	1969	1970	1971	1973	1975	1976	1978	1980
Variable											
XBT[1]	.006	.001	.028	.022	.020	.028	.035	.013	.007	.006	.007
RACE[2]	-	-	-	-	-	-	-	-	-	-	-
VET[2]	.045	.106	.209	.057	.102	.042	.014	.024	.016	.050	.038
CIVTRA[2]	-.054	-.272	-.026	-.083	-.101	-.084	-.042	-.017	-.052	-.110	-.098
CITY[2]	-.099	-.062	-.054	-.118	-.130	-.147	-.101	-.138	-.146	-.171	-.125
REGION[2]	-.200	-.240	-.216	-.200	-.170	-.119	-.182	-.103	-.170	-.082	-.079
MARSTA[2]	-.076	-.144	-.055	-.081	-.098	-.093	-.193	-.012	-.089	-.163	-.147
UNION[2]	.117	.105	.160	.153	.247	.196	.149	.213	.141	.250	.228

[1] effect=B*(XBT)*-0.1

[2] g=exp(c)-1

APPENDIX C

ESTIMATES OF EQUATIONS USING STEPWISE REGRESSION

Variables listed in order in which they were entered into the equation.

Table I

Results of Stepwise Regression for White Nonveterans

1966

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-.245	-.217
REGION	-0.134	-.125
DUNCAN	0.003	--
XBT	-0.966	0.066
HYGRADE	0.061	--
CITY	-0.126	-.118
UNION	0.104	.110
RSQUARE	0.276	
N	580	

1967

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-0.139	
REGION	-0.158	
DUNCAN	0.003	
XBT	-1.038	
HYGRADE	0.063	
UNION	0.154	
NRDEP	.055	
CITY	-0.108	
ROTTER	-0.000	
RSQUARE	0.360	
N	686	

1968

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-0.206	-0.186
DUNCAN	0.003	--
UNION	.149	0.161
XBT	-1.117	0.073
HYGRADE	0.067	--
CITY	-0.180	-0.165
REGION	-0.117	-0.110
ROTTER	-0.009	--
RSQUARE	0.381	
N	816	

1969

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-0.227	-0.203
DUNCAN	0.006	--
XBT	-0.991	0.063
UNION	0.185	0.203
CITY	-0.154	-0.143
HYGRADE	0.039	--
REGION	-0.105	-0.106
RSQUARE	0.428	
N	949	

1970

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-0.211	-0.190
DUNCAN	0.004	--
XBT	-1.102	0.068
HYGRADE	0.058	--
UNION	0.196	0.217
CITY	-0.163	-0.150
REGION	-0.106	-0.101
RSQUARE	0.408	
N	1073	

1971

Variable	Unadjusted Coefficient	Adjusted Coefficient
XBT	-1.092	0.066
HYGRADE	0.051	--
UNION	0.205	0.228
DUNCAN	0.005	--
MARSTA	-0.179	-0.164
REGION	-0.117	-0.110
CITY	-0.106	-0.101
CIVTRA	-0.095	-0.091
RSQUARE	0.449	
N	1210	

1973

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.004	--
XBT	-0.830	0.046
HYGRADE	0.052	--
UNION	0.168	0.183
MARSTA	-0.149	-0.138
CITY	-0.112	-0.106
NRDEP	0.040	--
SES	0.002	--
CIVTRA	-0.050	-0.049
REGION	-0.051	-0.050

RSQUARE	0.360
N	1352

1975

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.004	--
NRDEP	0.039	--
UNION	0.126	.134
HYGRADE	0.064	--
XBT	-0.799	0.039
CITY	-0.130	-.122
MARSTA	0.113	-.107
CIVTRA	-0.053	-0.052
REGION	-0.051	-0.051
RSQUARE	0.328	
N	1266	

1976

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.005	--
XBT	-0.835	0.035
HYGRADE	0.053	--
UNION	0.162	0.145
MARSTA	-0.154	-0.134
CITY	-0.128	-0.125
SES	0.002	--

CIVTRA	-0.062	--
ROTTER	-0.005	-0.060
NRDEP	0.023	--
RSQUARE	0.300	--
N	1242	

1980

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.005	--
XBT	-1.073	0.034
HYGRADE	0.047	--
CITY	-0.163	-0.150
MARSTA	-0.102	-0.097
SES	0.003	--
UNION	0.091	0.095
CIVTRA	-0.076	-0.073
NRDEP	0.029	--
RSQUARE	0.317	
N	1143	

Table II

Results for White Veterans of Stepwise Regression

1966

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-0.178	-0.163
DUNCAN	0.004	--
REGION	-0.147	-0.137
XBT	-0.480	0.033
CITY	-0.151	-0.140
RSQUARE	0.194	
N	264	

1967

Variable	Unadjusted Coefficient	Adjusted Coefficient
NRDEP	0.065	--
DUNCAN	0.003	--
REGION	-0.137	-0.128
UNION	0.099	0.104
CITY	-0.131	-0.123
MARSTA	-0.113	-0.107
RSQUARE	0.245	
N	270	

1968

Variable	Unadjusted Coefficient	Adjusted Coefficient
MARSTA	-0.164	-0.151
CITY	-0.120	-0.113
UNION	0.122	0.130
DUNCAN	0.003	--
RSQUARE	0.124	
N	281	

1969

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.005	--
NRDEP	0.061	--
CITY	-0.142	-0.132
UNION	0.174	0.190
XBT	-0.656	0.042
HYGRADE	0.044	--
REGION	-0.113	-0.107
CIVTRA	-0.086	-0.082
RSQUARE	0.306	
N	332	

1970

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.005	--
XBT	-0.746	0.046
UNION	0.254	0.289
HYGRADE	0.054	--
MARSTA	-0.148	-0.138
ROTTER	-0.011	--
RSQUARE	0.252	
N	353	

1971

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.006	--
XBT	-0.610	0.036
UNION	0.227	0.255
HYGRADE	-0.045	--
NRDEP	0.051	--
CIVTRA	-0.095	-0.091
ROTTER	-0.009	--
RSQUARE	0.333	
N	411	

1973

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.004	--
XBT	-0.603	0.033
HYGRADE	0.060	--
UNION	0.194	0.214
MARSTA	-0.116	-0.110
CIVTRA	-0.090	-0.086
NRDEP	0.037	--
ROTTER	-0.010	--
REGION	-0.068	-0.066
RSQUARE	0.342	
N	643	

1975

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.002	--
XBT	-0.791	0.039
HYGRADE	0.057	--
UNION	0.162	0.176
MARSTA	-0.126	-0.118
CITY	-0.113	-0.117
SES	0.002	--
RSQUARE	0.271	
N	680	

1976

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.003	--
XBT	-0.680	0.031
HYGRADE	0.053	--
UNION	0.171	0.186
NRDEP	0.048	--
SES	0.003	--
CITY	-0.080	-0.077
REGION	-0.065	-0.063
RSQUARE	0.287	
N	636	

1978

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.006	--
UNION	0.192	0.212
NRDEP	0.056	--
CITY	-0.152	-0.141
CHGDUN	-0.002	--
HYGRADE	0.047	--
XBT	-0.514	0.020
MARSTA	-0.140	-0.131
REGION	-0.069	-0.067
CIVTRA	-0.071	-0.069

RSQUARE	0.302
N	690

1980

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.005	--
CITY	-0.133	-0.125
NRDEP	0.034	--
HYGRADE	0.046	--
XBT	-0.546	0.017
UNION	0.139	.149
MARSTA	-0.087	-0.083
SES	0.002	--
RSQUARE	0.257	
N	635	

Table III

Results of Stepwise Regression for Black Nonveterans

1966

Variable	Unadjusted Coefficient	Adjusted Coefficient
REGION	-0.271	-0.237
SES	0.003	--
HYGRADE	0.029	--
MARSTA	-0.110	-0.104
CITY	-0.120	-0.113
RSQUARE	0.355	--
N	194	--

1967

Variable	Unadjusted Coefficient	Adjusted Coefficient
REGION	-0.344	-.291
DUNCAN	0.004	--
CIVTRA	-0.336	-.285
MARSTA	-0.167	-.154
SES	0.003	--
RSQUARE	0.415	
N	230	

1968

Variable	Unadjusted Coefficient	Adjusted Coefficient
REGION	-0.262	-0.230
HYGRADE	0.066	--
XBT	-0.699	0.044
DUNCAN	0.005	--
UNION	0.137	0.147
SES	0.002	--
RSQUARE	0.397	
N	291	

1969

Variable	Unadjusted Coefficient	Adjusted Coefficient
REGION	-0.250	-0.221
HYGRADE	0.050	--
XBT	-0.487	0.027
UNION	0.141	0.151
CITY	-0.131	-0.123
CIVTRA	-0.115	-0.109
RSQUARE	0.328	
N	327	

1970

Variable	Unadjusted Coefficient	Adjusted Coefficient
CITY	-0.158	-0.146
DUNCAN	0.003	--
UNION	0.204	0.226
MARSTA	-0.113	-0.107
REGION	-0.184	-0.168
HYGRADE	-0.042	--
XBT	-0.433	0.023
CIVTRA	-0.130	-0.122
RSQUARE	0.381	
N	359	

1971

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.006	--
UNION	0.155	0.168
CITY	-0.151	-0.140
MARSTA	-0.089	-0.085
HYGRADE	0.047	--
XBT	-0.536	0.028
REGION	-0.129	-0.121
CIVTRA	-0.089	-0.085
RSQUARE	0.436	
N	398	

1973

Variable	Unadjusted Coefficient	Adjusted Coefficient
HYGRADE	0.046	--
REGION	-0.173	-0.159
MARSTA	-0.163	-0.150
XBT	-0.498	0.024
CITY	-0.155	-0.144
DUNCAN	0.005	--
UNION	0.150	.162
SES	0.003	--
RSQUARE	0.451	
N	482	

1975

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.006	--
UNION	0.215	.240
CITY	-0.128	-0.120
SES	0.004	--
REGION	-0.163	-0.150
NRDEP	0.028	--
RSQUARE	0.366	
N	371	

1976

Variable	Unadjusted Coefficient	Adjusted Coefficient
HYGRADE	0.070	--
REGION	-0.175	-0.161
XBT	-0.565	0.022
CITY	-0.134	-0.125
DUNCAN	0.004	--
UNION	0.146	-0.136
RSQUARE	.426	
N	349	

1978

Variable	Unadjusted Coefficient	Adjusted Coefficient
HYGRADE	0.043	--
UNION	0.249	0.283
CITY	-0.202	-0.183
MARSTA	-0.161	-0.149
CIVTRA	-0.129	-0.121
DUNCAN	0.004	--
ROTTER	-0.014	--
XBT	-0.567	0.019
RSQUARE	0.427	
N	375	

	1980	
Variable	Unadjusted Coefficient	Adjusted Coefficient
HYGRADE	0.045	--
UNION	0.176	0.192
DUNCAN	0.004	--
CITY	-0.140	-0.131
MARSTA	-0.182	-0.166
XBT	-0.832	0.023
REGION	-0.123	-0.116
CIVTRA	-0.108	-0.102
SES	0.002	--
RSQUARE	0.441	
N	338	

Table IV

Results for Stepwise Regression for Black Veterans

1966

Variable	Unadjusted Coefficient	Adjusted Coefficient
UNION	0.369	0.446
RSQUARE	0.245	
N	22	

1967

No variables met criteria of 0.05 level of significance

1968

Variable	Unadjusted Coefficient	Adjusted Coefficient
UNION	0.279	0.314
XBT	0.856	0.053
CIVTRA	-0.234	-0.209
RSQUARE	0.531	
N	28	

1969

No variables met criteria of 0.05 level of significance

1970

Variable	Unadjusted Coefficient	Adjusted Coefficient
UNION	0.476	0.610
DUNCAN	0.009	--
SES	0.007	--
RSQUARE	0.545	
N	40	

1971

Variable	Unadjusted Coefficient	Adjusted Coefficient
UNION	0.328	0.388
CITY	-0.311	-0.267
MARSTA	-0.193	-0.176
RSQUARE	0.445	
N	72	

1973

Variable	Unadjusted Coefficient	Adjusted Coefficient
REGION	-0.352	-0.297
MARSTA	-0.351	-0.296
DUNCAN	0.004	--
HYGRADE	0.043	--
RSQUARE	.418	
N	128	

1975

Variable	Unadjusted Coefficient	Adjusted Coefficient
CITY	-0.305	-0.263
UNION	0.159	-0.147
SES	0.007	--
CHGDUN	0.008	--
RSQUARE	0.386	
N	111	

1976

Variable	Unadjusted Coefficient	Adjusted Coefficient
CITY	-0.269	-0.236
CHGDUN	0.005	--
REGION	-0.262	-0.230
CIVTRA	-0.175	-0.161
RSQUARE	0.265	
N	123	

1978

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.006	--
UNION	0.220	0.246
MARSTA	-0.219	-0.197
CITY	-0.255	-0.225
RSQUARE	0.274	
N	138	

1980

Variable	Unadjusted Coefficient	Adjusted Coefficient
DUNCAN	0.006	--
UNION	0.210	0.234
MARSTA	-0.188	-0.171
RSQUARE	.244	
N	120	

APPENDIX D

DESCRIPTIVE STATISTICS FOR DATA SETS DEFINED

BY DIFFERENT FULL-EMPLOYMENT CRITERIA: 1980

Table I

With Income Cutoff > 0 Only

Variable	N	N Missing	Mean	Min	Max
EXPER	2389	0	11.69	2.333	24
XBT	2389	0	0.338	0.091	.792
HYGRADE	2389	0	13.64	0	18
SES	2263	126	102.53	22	158
ROTTER	1835	554	22.28	11	42
INCOME	2280	109	7131.56	18.35	18350
CIVTRA	2389	0	.298	0	1
DUNCAN	2371	18	46.28	2	96
CITY	2389	0	.286	0	1
REGION	2389	0	.408	0	1
MARSTA	2389	0	.230	0	1
UNION	2389	0	.272	0	1
NRDEP	2385	4	1.647	0	9
VET	2389	0	.335	0	1
RACE	2389	0	.205	0	1

Table II

With No Income Cutoff

Variable	N	N Missing	Mean	Min	Max
EXPER	2666	0	11.78	2.333	24.00
XBT	2666	0	.335	0.091	0.792
HYGRADE	2666	0	13.66	0	18
SES	2527	139	103.18	22	158
ROTTER	2044	622	22.25	11	42
INCOME	2557	109	6359.00	0	18350.00
CIVTRA	2666	0	.303	0	1
DUNCAN	2648	18	45.88	2	96
CITY	2666	0	.303	0	1
REGION	2666	0	.402	0	1
MARSTA	2666	0	.224	0	1
UNION	2666	0	.244	0	1
NRDEP	2662	4	1.674	0	1
VET	2666	0	.335	0	1
RACE	2666	0	.189	0	1

Table III

With No WKSWK Cutoff

Variable	N	N Missing	Mean	Min	Max
EXPER	2776	0	11.80	2.333	24
XBT	2776	0	.334	.091	.792
HYGRADE	2776	0	13.62	0	18
SES	2628	148	103.00	22	158
ROTTER	2134	642	22.28	11	42
INCOME	2653	123	6240.44	0	18350
CIVTRA	2776	0	.301	0	1
DUNCAN	2757	19	45.31	2	96
CITY	2776	0	.305	0	1
REGION	2776	0	.409	0	1
MARSTA	2776	0	.234	0	1
UNION	2776	0	.242	0	1
NRDEP	2669	7	1.657	0	1
VET	2776	0	.331	0	1
RACE	2776	0	.196	0	1

Table I

DOD Term of Enlistment by Entry Age and Sex in %

for FY 1973 and FY 1983

Year/TOE	Male					Female				
1973	17	18-20	21-24	25+	Total	17	18-20	21-24	25+	Total
2 yr	8.7	11.6	14.4	13.6	11.3	4.0	3.4	2.9	3.7	3.3
3 yr	46.2	38.7	33.1	36.4	39.6	12.0	51.2	45.9	51.1	50.0
4 yr	43.6	47.0	48.1	44.7	46.4	16.0	43.2	47.7	39.9	43.9
6 yr	1.8	2.9	4.6	5.5	2.9	68.0	2.5	3.6	5.5	2.9
N	78,691	263,187	39,219	4,238	385,335	25	15,089	4,183	1,018	20,315
1983										
2 yr	2.9	3.3	3.4	3.9	3.3	2.6	1.2	.8	1.1	1.2
3 yr	36.7	27.5	25.7	27.9	27.8	32.7	31.8	30.3	35.2	31.8
4 yr	54.7	62.8	64.1	62.8	62.5	62.8	64.7	66.4	61.9	64.7
6 yr	5.8	6.5	7.0	5.6	6.5	2.0	2.4	2.6	1.9	2.4
N	17,568	179,127	51,677	15,466	263,838	1,409	21,048	8,804	3,858	35,119

Source: DMDC, Monterey, Barclay thesis, March, 1984

Note: Column %'s may not sum to 100 due to suppression of category UNKNOWN.

Table II

Army Term of Enlistment by Entry Age and Sex in %

for FY 1973 and FY 1983

Year /TOE	Male					Female				
1973	17	18-20	21-24	25+	Total	17	18-20	21-24	25+	Total
2 yr	17.3	20.4	26.1	20.9	20.4	0.0	5.2	6.0	6.6	5.4
3 yr	62.6	64.3	58.7	58.6	63.3	10.6	87.7	85.2	87.1	87.0
4 yr	20.3	15.4	15.3	20.5	16.5	0.0	6.3	8.6	6.4	6.8
6 yr	.1	.1	.1	.1	.1	89.5	.9	.1	0.0	.9
N	33,534	108,205	17,271	2,171	161,181	19	6,163	1,652	502	8,336
1983										
2 yr	5.5	7.8	7.8	7.3	7.6	4.8	2.7	1.6	1.8	2.4
3 yr	64.4	58.0	55.3	51.4	57.5	58.5	68.0	64.4	59.8	65.6
4 yr	30.2	34.3	37.0	41.3	35.0	36.7	29.4	34.1	38.5	32.2
6 yr	.1	.1	.1	0.0	.1	.2	0.0	0.0	0.0	.1
N	9,126	76,069	22,235	8,045	115,475	756	9,456	4,042	2,245	16,499

Source: DMDC, Monterey, Barclay thesis, March, 1984

Note: Column %'s may not sum to 100 due to suppression of category UNKNOWN.

Table III

Navy Term of Enlistment by Entry Age and Sex in %

for FY 1973 and FY 1983

Year/TOE	Male					Female				
1973	17	18-20	21-24	25+	Total	17	18-20	21-24	25+	Total
2 yr	.1	.1	.3	2.7	.1	0.0	0.0	.2	.6	.1
3 yr	56.7	44.8	36.5	40.3	47.1	25.0	53.9	47.4	43.2	52.2
4 yr	43.4	55.2	63.2	56.8	52.9	75.0	46.2	52.6	56.3	47.8
6 yr	.1	.1	.1	.4	.1	0.0	0.0	0.0	0.0	0.0
N	21,761	60,166	6,236	536	88,699	4	3,811	965	169	4,949
1983										
2 yr	.1	.1	.1	0.0	0.0	0.0	0.0	.1	0.0	.1
3 yr	.4	.3	.4	.6	.3	0.0	.2	.3	0.0	.2
4 yr	80.6	83.6	81.7	83.5	83.0	95.4	96.8	95.3	95.9	96.3
6 yr	18.9	16.1	17.8	15.9	16.6	4.3	3.0	4.1	4.0	3.4
N	3,923	42,939	12,504	4,101	63,467	235	4,909	2,061	934	8,139

Source: DMDC, Monterey. Barclay thesis, March 1984

Note: Column %'s may not sum to 100 due to suppression of Category UNKNOWN.

Table IV

Air Force Term of Enlistment by Entry Age and Sex in %

for FY 1973 and FY 1983

Year/TOE	Male					Female				
1973	17	18-20	21-24	25+	Total	17	18-20	21-24	25+	Total
2 yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 yr	86.3	88.7	85.2	78.4	87.9	0.0	93.2	90.1	83.3	92.0
6 yr	13.8	11.4	14.9	21.7	12.2	0.0	6.9	10.0	16.8	8.1
N	9,403	64,964	11,781	1,052	87,200	0	4,547	1,464	328	6,339
1983										
2 yr	0.0	.1	.1	0.0	.1	0.0	.1	0.0	0.0	.1
3 yr	0.0	.2	.2	.2	.2	.4	.2	.1	0.0	.2
4 yr	84.3	87.3	90.1	92.7	88.2	94.4	93.6	94.2	94.0	93.8
6 yr	15.6	12.7	9.8	7.2	11.8	5.3	6.3	5.7	6.1	6.1
N	1,489	34,370	12,758	2,643	51,260	285	5,357	2,323	562	8,527

Source: DMDC, Monterey . Barclay thesis, March 1984

Note: Column %'s may not sum to 100 due to suppression of Category UNKNOWN.

Table V

Marine Corps Term of Enlistment by Entry Age and Sex in %

for FY 1973 and FY 1983

Year/TOE	Male					Female				
1973	17	18-20	21-24	25+	Total	17	18-20	21-24	25+	Total
2 yr	7.1	28.3	28.3	22.2	22.1	50.0	31.7	20.6	15.8	29.7
3 yr	21.5	17.3	14.6	11.1	18.3	0.0	46.0	52.0	52.7	46.9
4 yr	71.3	54.2	56.8	66.4	59.5	50.0	22.4	27.5	31.6	23.5
6 yr	.3	.3	.5	.5	.3	0.0	0.0	0.0	0.0	0.0
N	13,993	29,852	3,931	479	48,255	2	568	102	19	691
1983										
2 yr	.1	.1	.2	.3	.1	0.0	0.0	.3	0.0	.1
3 yr	18.5	19.3	21.3	22.2	19.5	12.8	17.8	13.5	12.9	16.3
4 yr	80.6	79.6	76.1	75.7	79.2	85.8	80.4	82.9	85.5	81.6
6 yr	1.0	1.2	2.6	2.0	1.4	1.6	1.9	3.2	1.8	2.1
N	3,030	25,749	4,180	677	33,636	133	1,326	378	117	1,954

Source: DMDC, Monterey, Barclay thesis, March, 1984

Note: Column %'s may not sum to 100 due to suppression of Category UNKNOWN.

APPENDIX F

COMPARISON OF REGRESSION RESULTS FOR ELIGIBILITY CRITERIA

1978

Variable	Eligible Only	No Income Cutoff	Income > 0 Cutoff
XBT	-0.688	-0.643	-0.683
VET	0.062 (0.0180)	0.081 (0.0007)	0.090 (0.0004)
RACE	-0.201	-0.174	-0.159
CIVTRA	-0.074 (0.003)	-0.076	-0.085
HYGRADE	0.048	0.047	0.050
DUNCAN	0.004	0.004	0.005
NRDEP	0.027 (0.0015)	0.020 (0.0101)	-0.024 (0.0043)
CHGDUN	0.001 (0.8941)	0.000 (0.9398)	-0.000 (0.8711)
CITY	-0.144	-0.142	-0.157
REGION	-0.007 (0.7549)	-0.028 (0.1516)	-0.029 (0.1718)
MARSTA	-0.217	-0.178	-0.185
UNION	0.216	-0.188	0.195
SES	0.001 (0.2194)	0.001 (0.2246)	0.0001 (0.2298)
ROTTER	-0.003 (0.1352)	-0.005 (0.0185)	-.005 (0.0106)
RSQUARE	.2636	0.2758	0.2957

N	2934	2811	2567
DW	1.952	1.968	1.982

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4.	Chairman, Code 54 Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943	1
5.	Professor George Thomas, Code 54 Tc Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943	2
6.	Professor William McGarvey, Code 54 ms Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943	1
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END

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